This is a digital copy of a book that was preserved for generations on library shelves before it was carefully scanned by Google as part of a project to make the world's books discoverable online.

It has survived long enough for the copyright to expire and the book to enter the public domain. A public domain book is one that was never subject to copyright or whose legal copyright term has expired. Whether a book is in the public domain may vary country to country. Public domain books are our gateways to the past, representing a wealth of history, culture and knowledge that's often difficult to discover.

Marks, notations and other marginalia present in the original volume will appear in this file - a reminder of this book's long journey from the publisher to a library and finally to you.

Usage guidelines

Google is proud to partner with libraries to digitize public domain materials and make them widely accessible. Public domain books belong to the public and we are merely their custodians. Nevertheless, this work is expensive, so in order to keep providing this resource, we have taken steps to prevent abuse by commercial parties, including placing technical restrictions on automated querying.

We also ask that you:

+ *Make non-commercial use of the files* We designed Google Book Search for use by individuals, and we request that you use these files for personal, non-commercial purposes.

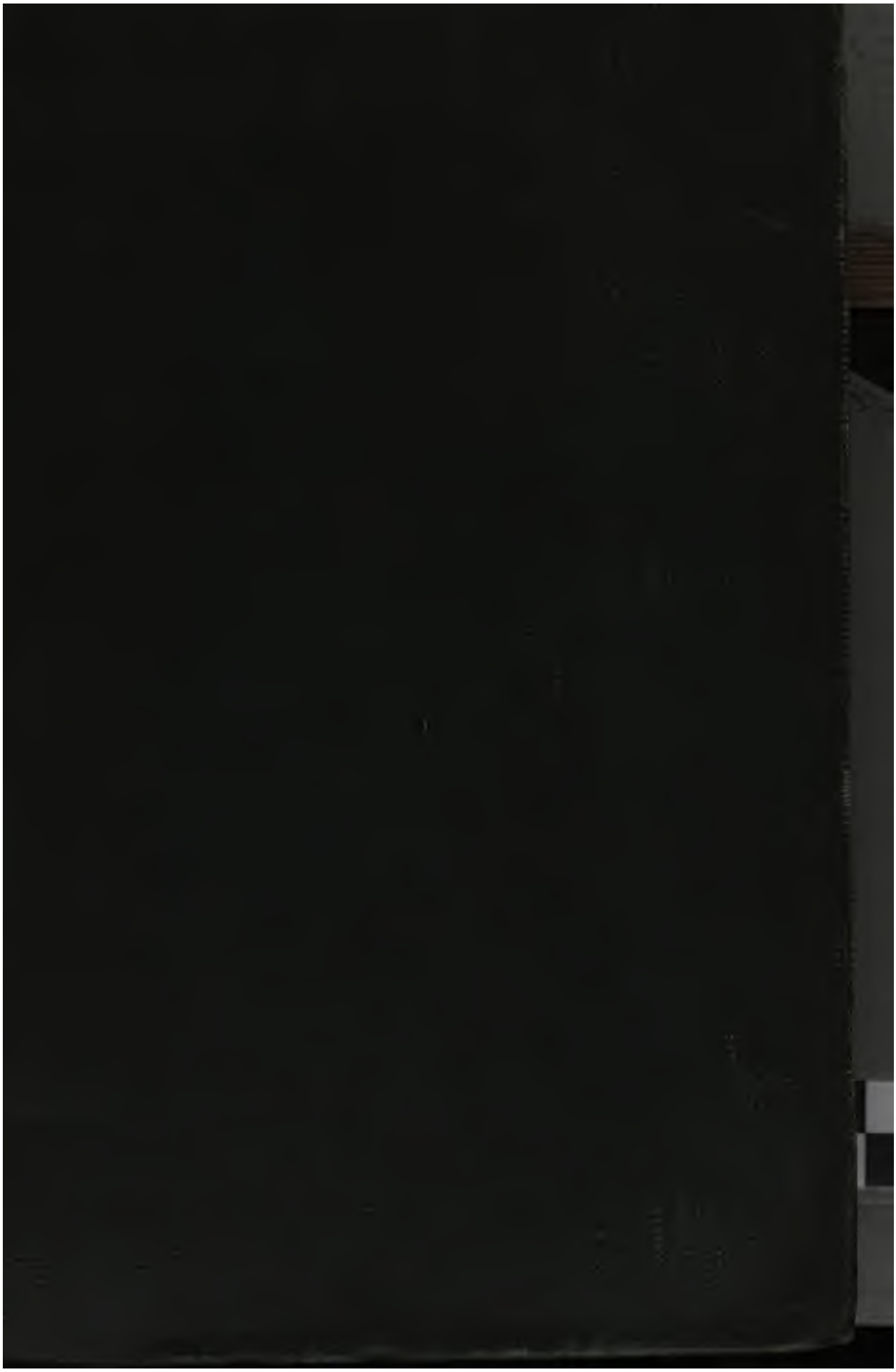
+ *Refrain from automated querying* Do not send automated queries of any sort to Google's system: If you are conducting research on machine translation, optical character recognition or other areas where access to a large amount of text is helpful, please contact us. We encourage the use of public domain materials for these purposes and may be able to help.

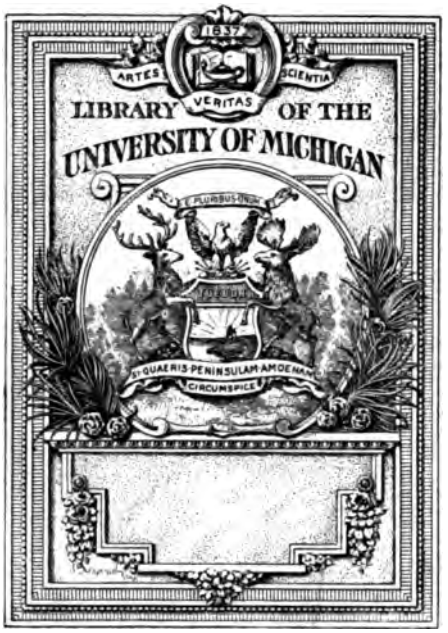
+ *Maintain attribution* The Google "watermark" you see on each file is essential for informing people about this project and helping them find additional materials through Google Book Search. Please do not remove it.

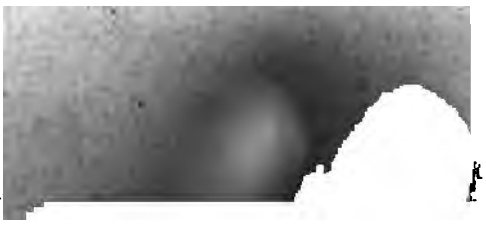
+ *Keep it legal* Whatever your use, remember that you are responsible for ensuring that what you are doing is legal. Do not assume that just because we believe a book is in the public domain for users in the United States, that the work is also in the public domain for users in other countries. Whether a book is still in copyright varies from country to country, and we can't offer guidance on whether any specific use of any specific book is allowed. Please do not assume that a book's appearance in Google Book Search means it can be used in any manner anywhere in the world. Copyright infringement liability can be quite severe.

About Google Book Search

Google's mission is to organize the world's information and to make it universally accessible and useful. Google Book Search helps readers discover the world's books while helping authors and publishers reach new audiences. You can search through the full text of this book on the web at `http://books.google.com/`




ARTES
VERITAS
SCIENTIA
LIBRARY OF THE
UNIVERSITY OF MICHIGAN
E PLURIBUS UNUM
SI QUAERIS PENINSULAM AMOENAM
CIRCUMSPICE



TRANSACTIONS

OF

THE CANADIAN INSTITUTE.

VOLUME III., 1891-92.

TORONTO:

PRINTED FOR THE CANADIAN INSTITUTE,

BY THE COPP, CLARK COMPANY, LTD., COLBORNE ST.

1893.

OFFICERS

OF

THE CANADIAN INSTITUTE,

1891-1892.

President:	Vice-President:
ARTHUR HARVEY, Esq.	JAMES H. PEARCE, Esq

Secretary	ALAN MACDOUGALL, M. Inst. C.E., F.R.S.E.
Treasurer	JAMES BAIN, Jr., Esq.
Librarian	D. R. KEYS, M.A.
Curator	DAVID BOYLE, Ph.B.
Editor	GEORGE KENNEDY, M.A., LL.D.

Members of Council:

A. B. MACALLMM, M.B., Ph.D.
W. H. ELLIS, M.A., M.B.
B. E. WALKER, Esq.
C. CARPMAEL, M A., F.R.S.C.
WILLIAM BRODIE. Esq.
CHARLES W. ARMSTRONG, Esq., *Secretary of the Biological Section.*
W. H. MERRITT, F.G.S., *Chairman of the Geological and Mining Section.*
J. C. HAMILTON, LL.B., *Chairman of the Historical Section.*

Assistant Secretary and Librarian:

R. W. YOUNG, M.A.

190871

CONTENTS.

		PAGE.
Officers 1891-92		iii
Special General Meeting		1
Summer Session at Penetanguishene		1
Transactions—Session 1891-92		5
Regulations of the Canadian Institute		31
Section I.	Of Membership, Election, and Fees	31
II.	Of the Officers and Council and the Mode of their Election	33
III.	Of the Auditors	34
IV.	Of the Council	34
V.	Of the duties of Officers	35
VI.	Of Meetings	36
VII.	Of Branch Societies	37
VIII.	Of the Property of the Institute	37
IX.	Of Visitors	37
X.	Agreement with the Natural History Society	38
XI.	Of Altering the Regulations	38
Regulations of the Library and Reading Room		39
Forty-Third Annual Meeting		44
Forty-Third Annual Report		45
Appendix I.	Membership	50
II.	Financial Statement	50
III.	Papers Read—Session 1891-92	53
Report of the Librarian		55
"	Biological Section	56
"	Geological and Mining Section	58
"	Historical Section	59
Proceedings of the Ornithological Sub-Section		62
Occurrence of the Evening Grosbeak in Ontario, 1889-90		111
Canadian Wild Flowers		125

D. W. BEADLE, B.A., LL.B.

St. Columba or Colum Cille 131
REV. NEIL MACNISH, LL.D.

Déné Roots 145
REV. FATHER A. G. MORICE, O.M.I.
I. Introduction 145
II. Vocabulary 153

Note on Ocean Steam Navigation 165
SANDFORD FLEMING, LL.D., C.M.G.

Note on Early Steamboats 174
SANDFORD FLEMING, LL.D., C.M.G.

Note on Postage Stamps 177
SANDFORD FLEMING, LL.D., C.M.G.

The Migration of the Evening Grosbeak in 1890 181
J. B. WILLIAMS.
Their Appearance in Ontario 182
Their Appearance in the States 184
The Cause of Migration 184
Their Food 185

The Bressa Prize 186

The Great Centre: An Astronomical Study 189
J. C. HAMILTON, LL.B.

The Abenakis of St. John River 195
EDWARD JACK.

Celtic Prosody 206
REV. NEIL MACNISH, B.D., LL.D.

National Characteristics and Migrations of the Hurons 225
A. F. HUNTER, M.A.

An Episode in the Pontiac War, 1763 229
LIEUT. RUTHERFORD.

Early Traders and Trade Routes in Ontario 253
CAPT. ERNEST CRUIKSHANK.

Lake Currents 275
L. J. CLARK.

The Private Correspondence of Lieut.-Col. Coffin, 1837 281
H. R. FAIRCLOUGH, M.A.

The Phocas of Terre Neuve 303
REV. PHILIP TOCQUE, A.M.

Proposed Change in Reckoning the Astronomical Day 307

Report of Committee 309
Appendix. Opinions of Astronomers 311

Bibliography of Publications of Canadian Institute 317

Archæology 317
Art 317
Astronomy 317
Bibliography 320
Biology 320
Classical Philology 323
Chemistry 324
Engineering 325
Ethnology 326
Geography 327
History 330
Jurisprudence and Law 331
Linguistics 331
Literature 332
Mathematics and Physics 333
Medicine 334
Political Economy 334
Psychology 335
Miscellaneous 335
Appendix 335

List of Members 337

TRANSACTIONS

OF

THE CANADIAN INSTITUTE,

SESSION 1891-92.

SPECIAL GENERAL MEETING.

Special General Meeting, 19th June, 1891, the President in the chair, to consider plans for the enlargement of the building, or the acquisition of a new site and other proposals connected with the extension or change of the buildings and work of the Institute.

After discussion of various proposals the following resolution was carried :—That it be an instruction to refer the question of the alterations, or the selection of another site, to the Council to report to the Institute at a future meeting.

SUMMER SESSION AT PENETANGUISHENE.

First Meeting, 25th September, 1891, at 15.30 o'clock, in the Pavilion of "The Penetanguishene," E. A. Meredith, LL.D., in the chair.

Mr. A. F. Hunter, B.A., read a paper on "Military and Naval Exploits on the Nottawasaga during the War of 1812."

Towards the end of the year 1813 the Americans began to make preparations for the re-capture of Michilimackinac, which had been taken from them the year before. A relief expedition left Kingston in February, 1814, for that northern post, and halted on the Nottawasaga River. Here they constructed batteaux for their transportation across Georgian Bay, and a few weeks later a blockhouse was erected near the mouth of the river. This blockhouse was attacked by American boats on August 14th, 1814, and destroyed, as well as the Northwest Company's schooner *Nancy*, which was lying in the river at that place Some extracts from books, now become rare, were given to throw light upon the incidents of that skirmish, besides two accounts from pioneers of the county.

It was stated in answer to enquiries that "Michilimackinac" meant "Great Turtle" and was shortened to "Mackinac" by the French, that

Gloucester Bay was on the other side of Tiny peninsula from Matchedash Bay, that the whole bay was called Gloucester Bay by Governor Simcoe in 1793, and that the route to Drummond Island was used till 1841.

Mr. A. C. Osborne read a paper on "The Land of the Wyandots."

Mr. O. A. Howland said the reader referred to the Indians offering tobacco to the Chaudiere Falls. It was probably as a propitiation to some presiding spirit, offered to secure a successful journey on the Great River. He had heard from the Indians on the North Shore of Lake Michigan a similar tradition about the cliff called the "Lover's Leap" on Mackinaw Island. The cliff overlooks the Straits of Mackinaw. The island is about midway in what must have seemed to canoemen a "grand traverse." According to the tradition given him, which he believed to be the true one, the Indians used to land and lay their offerings on this natural altar to the good or evil spirit presiding over the spot as thanks for a safe voyage so far and propitiation against the dangers of the remainder of the passage.

Rev. Father Laboureau said the offering of tobacco is not out of date. A practice still exists among many Indians of throwing a bit of tobacco to the "old woman."

Mr. Alan Macdougall read a paper on "The Indians of the Pacific Coast, an Attempt to Define their Artistic Work."

Second Meeting, 25th September, 1891, at 20 o'clock, in the Town Hall, the Mayor in the chair.

The Mayor delivered an address of welcome, to which a reply was made by Dr. Meredith.

Mr. David Boyle read a paper on "The Indian as a Mechanic"

Rev. Father Laboureau read a paper on "The Early History of the the Mission of St. Anne's, Penetanguishene." There was, he said, a naval and military station in Drummond Island at the time of its cession to the United States, and also a considerable number of traders, merchants, and their servants, mostly French Canadians, half-breeds, and Indians. The military and naval post was removed in the fall of 1827 to Penetanguishene. The civilians followed in the spring of the following year, landing at what is now the Reformatory Point. Barracks were then erected, and the civilians, after a year and a half, removed to the present town. The Indians were scattered around at Waubaushene, Coldwater, Beausoleil, Manitoulin, some staying at Penetanguishene. In February, 1832, Bishop Macdonnell, of Kingston, made his first pastoral

visit, accompanied by Father Crevier, the resident missionary on Sandwich Island, in Detroit River. Then clergymen came occasionally until the arrival of a resident priest. The absence of a regular clergyman was made up for partially by the devoted zeal of a Frenchman named D. Revol, who assembled the people for prayer on every Sunday and Church holidays, instructed them in their faith, and was especially successful with the Indians. He spent his time, money, and all that was best in him in their service. A log church was built in 1835 where the town hall now is. It became too small for the increasing congregation, and a new one was erected and blessed in 1861 by Archdeacon (now Archbishop) Walsh Then in 1871 was commenced the memorial church in memory of the martyred Jesuits, De Brebœuf and his companions. The basement has been used for service since 1890. It is still unfinished. In 1835 the Rev. J. Baptiste Proulx came as resident missionary. He was specially interested in the Indians, and, having obtained another priest in 1837, Father Amable Charest, to reside in Penetang, he went with them to Manitoulin Island. In 1845 he transferred the care of them to the Jesuits, who have had remarkable success with them. Father Laboureau then gave an account of the different missionaries who have since laboured among whites and Indians in Penetang and neighbouring districts.

Mr. A. F. Hunter, B.A., read a paper on "National Characteristics and Migrations of the Hurons, as indicated by their remains in North Simcoe."

The Indian name of Lake Simcoe was *Ouentaron*, meaning "beautiful lake." It was called *Lac aux Claies* or the lake of the hurdles by the French, which became corrupted into *Lac la Clie*, and so called for 150 years after the Huron-French period. It is altogether likely that the hurdles referred to in the name were those found at the Narrows . . . . . The Huron-Indian village of Cahiagua, mentioned by Champlain, was situated three leagues (nine miles) from the Narrows, and not at Orillia as claimed by some writers on the subject. Remains of a Huron village are still to be seen at a place in the Township of North Orillia, corresponding closely with the position of Cahiagua as indicated by Champlain.

Mr. D. B. Read, Q.C., read a paper on "Macbeth, Historical and Dramatic."

Mr. A. C. Osborne presented to the Institute a stone knife and a stake from the "Narrows" at Orillia.

Third Meeting, 26th September, 1891, at 15 o'clock, in the Indian Council House on Christian Island, Dr. Meredith in the chair.

John Monague addressed the meeting in Indian, which was translated by John Lake, as follows :—

"I was born on the banks of the Nottawa River. The first thing I can remember was seeing ships anchored at the mouth, but I am not positive whether they were sunk there or not. (This statement, uttered incidentally, corroborates that of Mr. Hunter.) I did not travel much when young, only round about my home. I once went up to Sault Ste. Marie. Then I made a trip to Toronto, where I saw people marching round with drums, and wondered what it all meant. The Indians there told me that there was a war or rebellion. When I was in Toronto the Government sent men to tell the Indians that everyone over 21 years was to turn out and help find Mackenzie. A reward of $1,000 was offered to the person who brought in Mackenzie's head. Four or five of us then started out to hunt for him, but we did not know him, and could not have taken him. The Indians told us he had gone over the Big falls; that he had walked to the front in woman's dress, and so we missed him. The Indians were then told to go to a house beyond Holland Landing, towards Barrie, in which there were plenty of weapons left by the cavalry. When we got there the house had been burned down. Afterwards I and my tribe settled in Coldwater and remained there about twenty years. We then went to Beausoleil Island and stayed there about fifteen years. Captain Anderson was the agent then. He told me that he would try to lease a mill we had on the Island to George Copeland for twenty years and that we should go to another island. We then moved to Christian Island and Manitoulin, the greater number went to the latter place. When we were moving Chief Assance was drowned, and he was succeeded by his son, who has been chief ever since. After Anderson, Jarvis came. He always came in a big canoe. After business was over he made us have canoe races, men in one canoe, women in another. He used to steer for the women, who always won. On these occasions his hat would be beautifully decorated with ribbons. Jarvis gave blankets as prizes. I do not know whether they belonged to Jarvis or to the Government. I used to go with Jarvis to Manitoulin as his pilot."

Mr. A. C. Osborne read a paper on "The Flight of the Hurons from Ste. Marie to Christian Island."

The following resolution was carried on motion by Mr. Boyle, seconded by Dr. Ellis :—

"That in the opinion of the Canadian Institute it is desirable that steps should be taken to preserve as far as possible the ruins of the old forts on the Wye and Christian Island, and that with this object in view it would seem proper that the Institute should address the Provincial Government,

the Councils of Simcoe County, Midland City and Penetanguishene, the Grand Trunk Railway Company and the Indians of Christian Island, asking those bodies to unite for this purpose."

Votes of thanks were passed to the Mayor and Council, to Chief Assance, John Monague, Father Laboureau, and Mr. Walter J. Keating for their efforts in promoting the success of the meetings.

FIRST MEETING.

First Meeting, 7th November, 1891, the President in the chair.

The President delivered his inaugural address: "A Critical Review of the Enterprise of Christopher Columbus." Previous discoveries by the Cabots were sketched, the disastrous and murderous government of the Spaniards in America alluded to, and the motives attributed to Columbus, not altogether unselfish, dealt with. After the address, a photograph in colors of the solar spectrum, thought to be the first ever exhibited in America, was shown.

SECOND MEETING.

Second Meeting, 14th November, 1891, Mr. J. Davies Barnett in the chair.

Donations since the Annual Meeting 68, Exchanges 1731.

A report of the summer work of the Biological Section was read.

The following were elected members:—Alfred Boyd, V. B. Wadsworth, William Ker, M. B. Aylsworth, Henry Wade, T. C. Jackson, Milner Hart, Daniel Clark, M.D., Henry E. Caxton, Thomas M'Crosson, W. J. Keating, A. C. Osborne, A. P. Coleman, Hon. J. B. Robinson.

Mr. W. J. Smith read a paper on "The Formation of Niagara River." He opened his reading with recounting the theories held by Sir Charles Lyell, Mr. Blackwell, Prof. Gilbert, Prof. Scovel, and others, all varying in statement of method, but all agreeing on the one point that the "Gorge," from Lewiston to the Falls, has been due to the action of the waters eroding the rocks backwards. Mr. Smith contends that facts do not substantiate the theory so held in any one particular, and he first takes the ground that Niagara river should not be the only instance in the world where waters in similar positions have eroded their rock bed. In support of his non-erosion theory, he recites parallel instances in a number of well-known falls within the Dominion—coeval in point of time

with the Niagara. He instances falls on the European and African continents, particularly one described by Livingstone on the Zambesi. The waters of that immense river have fallen into a rock crevice about 60 feet wide, and the full span of the river, over 3,000 feet. For untold ages the waters have beaten the wall rock of that fissure, and erosion has not taken place ; yet under such an erosion theory as set up by the scientists the waters should have increased the opening, even under a recession rate of three inches per annum, at least 7,000 feet ; in other words it should have formed a similar gorge to the Niagara of that extent. The rock was "Basaltic," therefore much more friable and easier to erode than the limestone rock forming the bed of Niagara river and its gorge. This river was certainly coeval with the Niagara, and, at a recession of one foot per annum, it should have presented a gorge far in excess of the length of the Niagara. He claims the instances in our own country should have presented corroborative evidence of erosion, yet they do not. Speaking of the recent report of the engineers of the New York State Geological Survey of the cliff of the Falls, and its recession, Mr. Smith places it in many peculiar ways. For instance: The report states that the total superficial area of rock which has disappeared between 1842 and 1890 is, at the American Falls, 32,900 feet, or 755-1,000 of an acre, and at the Horseshoe Falls 275,400 superficial feet 6 32-1,000 acres. If, then, such was the case, as the superficial area must be multiplied by the rock, depth or fall of water, 164 feet, and divided by the number of days in the 48 years, there should be a daily loss of rock equal to 190 tons, yet, as he puts it, the vertical face of the rock at the Falls, as well as the rock forming the cascades, presents the same old moss-grown face which it has done each and every day during all time. If the rock eroded, how could the vegetable growth exist on any part thereof? Mr. Smith argues further that Goat island "presents a vertical face of 1,500 feet in length and 100 high on the line of the falls. It is similar in appearance to the rock surrounding and lining the "gorge." Evidently, then, that island was at one time produced across the chasm, and more than likely joined the main rock on the Canadian side. Now let these scientists take either horn of the dilemma. If that island joined the main rock, how did the waters get over the 100 feet high rock barrier to enable the formation of its present appearance? The American falls were open, therefore all waters must have flowed over at that time, the rock island could not have then been eroded. Extend the island even part of the way, and its appearance demands the production, therefore the waters would have flowed around to the west and over our Canadian park, making connection further down the "gorge." In no way could the island be eroded. Mr. Smith describes the formation as due to fracture. He

enters into many particulars as to the method, treating it on well-known geological lines. He supports his theory by existing evidence. He admits the startling nature of his thesis, in the face of the statements of so many scientists, but he says the evidence of facts will always displace that of theory. The facts in this case are so many that, when studied from his standpoint, conviction must follow. He denies emphatically that there was an "ancient river bed," and brings proof to bear, stating that such an outflow could not be restrained by any gravel and clayey bed as the old course is said to have been. Nothing but a rock barrier could have confined the waters. The theory he said was so radical a change from that which we have been led through so many years to believe as to confound us for the time being. But the question was deserving, from a scientific point of view, of the most careful investigation.

THIRD MEETING.

Third Meeting, 21st November, 1891, the President in the chair.

The President, Secretary, and Dr. Meredith were appointed to represent the Institute at the Prison Reform Conference to be held on the 27th November.

Donations and Exchanges since last meeting, 54.

Daniel Rose, R. A. Donald, Ernest Lefroy, and Dr. G. B. Smith were elected members.

Dr. Kennedy read a paper by the Rev. A. G. Morice on "Déné Roots," the principal portion of which is a vocabulary, showing the equivalents in about 20 dialects of 370 English words and phrases. The object of making this vocabulary is to enable students in other parts of the world, and especially in Eastern Asia, to compare their words with corresponding words in the languages of other tribes, and thus lead to important conclusions as to the affinity of widely separated nations. In a brief introduction the Rev. Father shows the supreme importance of comparative philology in discussing the affinities of races, and outlines some of the characteristics of the languages he is dealing with.

Mr. Macdougall referred to a former paper by Father Morice, in which it was stated that almost all the customs in the book of Leviticus were found among the Indians. From the striking resemblance of the Indians to the Mongolians, it was natural to conclude that the west coast of America had been settled from the eastward. A Japanese man of war had put into the harbor of Esquimalt. The sailors dressed up some of

the Indians in their own clothing, and it was difficult to distinguish the Indians from the Japanese.

Dr. W. R. Shaw read a paper on the disease called "Peach Yellows." After sketching a history of the disease in the United States and Canada he went on to detail the signs which characterize the disease. He enumerated the preliminary results which he has obtained during the past season in the bacteriological investigation of the disease, and demonstrated that a particular germ has been found which is the probable cause of it. He stated that he would lay before the Institute at some future date the results of inoculations, etc., into healthy vines to find out if the diseases be actually due to the bacillus which he has found. Dr. Shaw's paper was illustrated by the microscope and culture tubes.

Prof. Macallum said that it had been stated to him that probably in six or seven years there would be no peach orchards in Niagara. He hoped that Dr. Shaw would continue to pay attention to the subject, as the results were such as would reward him for his investigations. He suggested that the Biological Section should take up the matter. The Institute should also take action. They should urge the importance of the subject on the legislature, and in view of the great annual loss sustained of about $100,000, should obtain aid in carrying on the investigation. As the whole Dominion was interested in this matter of diseased peaches it should also be brought to the attention of the Dominion Government and stringent measures adopted.

A resolution was passed referring the paper to the Council of the Institute to take necessary steps to bring the subject before the Government and people of the Province and Dominion.

FOURTH MEETING.

Fourth Meeting, 28th November, 1891, the President in the chair.

Donations and Exchanges since last meeting, 44.

Prof. J. G. Hume, and Henry Duggan were elected members.

A paper by Dr. MacNish on "St. Columba or Colum Cille," was read. The paper gives some facts as to the geography and history of the island of Iona, sketches rapidly the life and work of St. Columba, gives some account of his writings, and concludes by a comparison of a number of words and phrases in the Irish and Scottish dialects of the Gaelic language.

The following resolution was passed on motion by Mr. Clark, seconded by Mr. Morrison :—

That the Secretary be requested to obtain from the City Council the results of the observations taken on lake currents, with a view to consideration thereof and report by the Committee.

FIFTH MEETING.

Fifth Meeting, 5th December, 1891, the President in the chair.

Donations and Exchanges since last meeting, 73.

Mr. F. E. P. Pepler was elected a member.

A resolution was adopted requesting the Vice-President and Secretary to attend the meeting of the Ontario Society of Artists in regard to obtaining the old Upper Canada College buildings from the Ontario Government for art and science purposes.

A paper was read by W. A. Sherwood, A.R.C.A., on "The Spirit of National Art." He lamented the fact that there was so little of this spirit in Canada, and that national art was almost unknown. He made reference to the life labor of Sir Joshua Reynolds, who strove to build up a national art in England. The results of his work may now be seen in the magnificent art in England to-day, which compares favorably with that of any other country. In this democratic country there is no patronage, and all that can be looked for is a broad sympathy with every department of art. This broad sympathy was a more powerful factor in building up a national art than any individual patronage, and he looked forward to the time when it would be heartily extended. The art of any country should reflect the individuality, the customs and the philosophy of the people. The spirit of national art has a patriotic tendency, and the state should assist in fostering it to the utmost. Its object and aim is to develop to the furthest every portion of the community to a higher appreciation of created things, to bring the mind in closer communion with nature, viewing with reverence all created forms and all conditions of social and domestic life. Like its sisters, music and poetry, it strives to touch with a delicate hand the finer sensibilities of nature: like its sterner sister science, to wield no uncertain wand over the grosser prostitution of sacred things; a priestess in the temple of nature truly zealous of her sacred duties, keeping the lights ever burning upon the golden minarets of the altar. The homogeneous condition of the Canadian commonwealth would in time produce an art peculiarly national and superior to that of any other country. In it would be

combined all the beautiful characteristics of the English, the French, the German and the Italian schools, and it would also have the refining influence of the Japanese art. He looked to the French in Quebec to produce a great Canadian painter. Speaking of the spirit of art in the United States, Mr. Sherwood remarked that there was but little of it there. The wealthier class practically despise American painters and search in the art centres of the old world for the adornments of their homes. Whistler, for instance, is now looked upon as a very eminent painter in England. In Baltimore, his home, where he worked for years, he was neither appreciated nor recognized. Canada, with its lakes, its forests, its glorious scenery, its clear sky and its noble people, should produce a school of art superior to any in the world. He laid great stress on the sacredness of art, and in its refining and elevating influences he placed it on an equal footing with the pulpit and the professor's chair.

Mr. Pursey thought that the best pictures were not exact representations of nature. The artist took the outline from nature and filled it up with the ideal.

Mr. Macdougall referred to pictures that were defective from a lack of scientific knowledge on the part of the artist or a want of accurate observation of nature. Some were defective in their cloud effect, owing to the neglect of the study of meteorology. In a picture of sheepshearing the shearer was represented as shearing with his left hand. A countryman who saw it and had more accurate knowledge of nature than the artist, said the picture was wrong, as the man could not shear the sheep with his left hand.

Mr. Fairclough referred to a painting of Turner's in which the Thames was represented flowing the wrong way.

The President remarked as to religious art that there was none in the world at the present day; the earlier productions of the European painters were inspired by their strong faith. As this faith gradually died out, there was a corresponding decline in religious art. He thought that historical art was not to be looked for in Canada. In paintings of scenery the Canadian artists had done very well. They had produced some charming pictures that were fully equal to those on the other side. He thought that their works were very fairly appreciated, and brought good prices. He held that the present time was not one in which art could attain a high level. It was too practical. It was a photographic age. People required an actual representation of nature. It was not always desirable to have an actual representation of nature. As to the pictures placed before children in the schools he gave reasons why

perfect pictures should not be placed before them. He thought that they could not comprehend a finished and perfect picture and that it would be better to give them something simple.

SIXTH MEETING

Sixth Meeting, 12th December, 1891, the President in the chair.

Donations and exchanges since last meeting, 117.

Mr. J. A. Fowler was elected a member.

A committee was appointed to co-operate with the committee of the Ontario Society of Artists in their endeavours to obtain some portion of the Upper Canada College buildings for art and science purposes.

The Committee on Lake Currents appointed last session was continued, with power to add to their number.

Mr. A. F. Chamberlain, M.A., late of Toronto, now of Clark University, Worcester, Mass., was appointed to represent the Canadian Institute at the meeting of the American Folk-Lore Society, which will be held at Washington on the 29th and 30th December inst.

Mr. W. A. Douglass, B.A., read a paper on "The Finances of the American Civil War."

SEVENTH MEETING.

Seventh Meeting, 19th December, 1891, the President in the chair.

Donations and exchanges since last meeting, 50.

Messrs. Samuel McAllister, C. C. James, and H. R. Cockin were elected members.

The following resolution, sent up by the Historical section :—"That the members of this section consider that the setting apart and proper maintenance of a portion of the public domain as a national park would much conduce to the fostering of patriotic feeling as well as be a means of increasing interest in Canada abroad, and therefore resolve that the Institute be requested to memorialize the Dominion and Local Governments to the end that such action may be taken as will result in this object," was referred to the Council.

Mr. Levi J. Clark read a paper on "Testing the New Water Pipe," in which he briefly described the construction and laying of the pipe, and its history since it came into use. The method of ascertaining the amount

of the leakage was minutely described, and the conclusion drawn by him was that from 84 to 140 gallons per minute of bay water was finding its way into our water supply. The quantity varies with the location, being greater the nearer the pumping station is approached. He illustrated his paper by drawings on the blackboard, and referred to several scientific truths relating to the flow of water in pipes, which were exemplified in the course of the investigations. He thinks that the only leak of any consequence has now been discovered at the crib at Hanlan's Point, and that there will be no difficulty in stopping it, when the long-standing charge of our city water being polluted by bay water or sewage may be wiped from the slate.

EIGHTH MEETING.

Eighth Meeting, 9th January, 1892, the President in the chair.

Donations and exchanges since last meeting, 289.

The Rev. Philip Tocque, A.M., read a paper on "The Aborigines or Bœothicks of Baccalaos."

The report of Mr. A. F. Chamberlain, delegate from the Canadian Institute to the annual meeting of the American Folk-Lore Society, held in the city of Washington, December 29th and 30th, 1891, was read. It stated that the meeting was very successful, each day's attendance being large and appreciative. The Society ended its third annual gathering with the confidence that the study of folk-lore in America was now being carried on in true scientific spirit, and the fields of investigation, hitherto almost untouched, bid fair before long to yield rich harvests. Seventeen papers were read, dealing largely with the lore of the aborigines, although the study of the folk-lore of the European immigrants was duly represented. Due recognition of the Canadian members of the society was made in the election of Horatio Hale, of Clinton, Ont., and James Deans, of Victoria, B.C., as members of the Council. It was gratifying to know that not only at the meeting of the Folk-Lore Society, but also at those of the Modern Language Association of America, the American Dialect Society, the American Historical Society, and the Society of Church History, all of which met in Washington contemporaneously, the programmes show that Canada was well represented in the papers which were read.

NINTH MEETING.

Ninth Meeting, 16th January, 1892, the President in the chair.

Donations and Exchanges since last meeting, 50.

On a communication from Dr. Rosebrugh the following resolution was adopted :—

"That we heartily approve of the ten resolutions adopted by the Provincial Prison Reform Conference held in Toronto, November 27th, 1891; that the same are commended to the favourable consideration of our legislators, both Dominion and Provincial, and that copies of this resolution be forwarded to the Hon. Sir John Thompson, Minister of Justice, and to the Hon. Oliver Mowat, Attorney-General, Province of Ontario, and to the Press for publication."

Mr. George E. Atkinson was elected a member.

Mr. William Houston, M.A., read a paper on "Economic Science for Canadian Students."

Mr. Harvey had listened to Mr. Houston, as he always had done, with the greatest pleasure. On nearly all the points he agreed with him. There were a few, however, on which he differed. He did not think that economic science was one of locality. In his opinion economic science did not belong to a small community, but to the brotherhood of mankind at large. But was there such a science as political economy? There was no more a science of political economy than there was of literature. There could be no exact science of either. Behind all this was the question, What was truth? The idea of what was truth was continually changing except in the mathematics. When you come to enquire what was perfectly just between man and man, there was constant change. As to the method of investigation, the inductive method had been the most successful for the past 300 years. He did not think that we should neglect the deductive method. The former was the best when we were young, the latter when we were old.

TENTH MEETING.

Tenth Meeting, 23rd January, 1892, the President in the chair.

Donations and Exchanges since last meeting, 66.

A paper by Mr. Edward Jack on "The Abenakis of the St. John River," was read by Mr. Macdougall. The paper deals with the history and legends of the tribe, gathered during many years of intercourse with them. They originally inhabited what is now Maine, New Hampshire, New Brunswick, and even a portion of Nova Scotia ; and were subdivided into several divisions. The principal ones took their characteristic names from the districts they lived in ; such as Kanibesinnoaks, "those

who lived near the lakes"; Sokowakiakio, "men of the south"; Nurhantsuaks, "those who travel by water." The remains of the tribes called "Muskrats" and "Etemankiaks," now called Malecites, occupy the greater part of New Brunswick. The early connection of the tribe with the English is found in their word for king, which is Kinzames, evidently intended for King James of England. A somewhat similar name is used for our Queen. The Abenakis say they came from the West, and originally worshipped the sun and moon. The first missionaries to visit them were the Jesuits, who came among them in 1611. Numerous legends are given, which are similar to some of those of our Western Indian. On relating the story of the beaver, muskrat, and squirrel to a Chippewah in Wisconsin, the latter knew it well. The story is that the muskrat lent the beaver his tail, which the latter refused to return; the Chippewah added to this, yes, and he has been whining for it ever since.

The President read some notes in which he gave further particulars respecting the Abenakis. In 1641 we first get the name of the Abnaquiois. In 1643 we find in the "Relations des Jesuites" that the Abnaquiois had no dealings with any but the English. 1644-1646, some Abnaquiois came to Quebec and were baptized by Father Dreuilletes. 1647. There is a whole chapter in "Les Relations" respecting them. Father Dreuilletes studied their language, and said it had no little similarity to the Algonquin.

ELEVENTH MEETING.

Eleventh Meeting, 30th January, 1892, the President in the chair.

Donations and exchanges since last meeting, 53.

Mr. Alexander MacInnes was elected a member.

Messrs. Bain and Macdougall were appointed delegates to the Industrial Exhibition Association.

Communications were read from the Manchester Geographical Society announcing the death of the President, the Duke of Devonshire; from the Royal Society of Canada respecting their meeting in May; and from the Committee appointed by the Spanish Government on the celebration of the fourth centenary of the Discovery of America inviting the co-operation of the Institute.

The President laid on the table his paper on "The Position of the French Race in Canada," read by him at the Congress of Roman Philo-

logy held in Montpelier, and published in *La Revue des Langues Romanes* with a note by Dr. Bourinot on French Canadian Biography.

Mr. Henry Spencer Howell read a paper on "The Volcano of Kilauea and the Hawaiian Islands."

The Hawaiian Islands are situated in the North Pacific ocean, lying between the 18th and 23rd parallels of north latitude, and from 155° to 161° west longitude; and are, therefore, just within the tropics. There are eight principal islands, Hawaii, with an area of 4,210 square miles; Maui, 760; Oahu, 600; Kauai, 590; Molokai, 270; Lanai, 150; Niihau, 97; and Kahoolawe, 63. The last named is uninhabited; and there are four small islets, one of which (Molokini) is an extinct volcano with one side of the crater open to the sea—showing either subsidence or denudation. No finer climate can be found in any part of the world; it is as salubrious as that of Madeira, and its evenness is the delight of those who come here for pleasure or to benefit health. The tropical heat is so tempered by the sea breezes—the soft trade winds of the north—that the greatest degree of heat at Honolulu during the past twelve years was 90° in the shade, while the lowest was 54°; the average being 75°. The daily range of the thermometer is 12°. Of course it is hot in the sun at noon; but the mornings and the evenings are delightful. Sugar is the chief product; and rice, tobacco, coffee, bananas, and pineapples are grown in great quantities; all sorts of citrous fruits abound, and the cocoa palm grows to perfection. Most people are under the impression that these islands were discovered by Captain Cook, and many books chronicle the error—for an error it is; they were discovered by Gaetano, an early Spanish navigator, in the year 1542, and the chart drawn by Mendana in 1567 gives a very nearly accurate position of the group—absolutely correct in regard to Kauai. There is a tradition among the natives that two vessels from Spain were wrecked on the large island about 1527, in the reign of Kealiiokaloa, a king of Hawaii. Captain Cook, on his second visit, landed at Kealakekua Bay: on his former visit Cook was looked upon as a god—the long-lost "Lono" of the Hawaiian Trinity—and he was treated with the greatest respect; the natives say that he allowed himself to be worshipped, and accepted sacrifices as a deity; but in their last visit, February, 1779, the Englishmen seem to have acted like pirates, for they over-ran the heiaus (sacred temples), broke the tabus (religious laws), demanded the best of everything in the way of fresh meat and fruits, and the sailors of the Resolution and Discovery took the greatest liberties with the natives. Then began a series of petty quarrels between the ships' officers and the chiefs, ending in the death of several native chiefs and the luckless circumnavigator, whose name is revered in England and

the colonies, but not in these islands, for overweening confidence, carelessness, and vanity are not considered by the Hawaiians as attributes of a commander. The early history of the people of Hawaii and the other islands is unknown ; the place whence they originally came, the date of their first appearance here, and the primary source of their religion, are mysteries that will likely remain unsolved forever. Taken into consideration that their traditions have been handed down verbally from father to son and from chief to chief—or chiefess—it is remarkable that they have preserved so much of the history of their ancestors ; from the year 1095 (approximate) to the present day there has been an unbroken line of sovereigns of Hawaii. During the three centuries preceding the "Confederation" the history of these islands is one long story of romance, warfare, and religion ; a story of a noble race, of brave men, and gentle, loving women—a nation-story much the same as it is, was, and ever will be, all the world over ; with men of all creeds and colours, two great factors influence their lives for better or for worse—ambition and affection. Although the Hawaiians never practised the horrible habit, cannibalism was common among a band of savages who came from one of the South Sea Islands and established themselves for a time in the mountain districts of Kauai and on the northern shore of Oahu. But they were not permitted to stay long there, for the natives, finding out that they were man-eaters, made war upon them and drove the foreigners from island to island ; till finally the "consumers of home production" were forced to set sail for the place from which they came—the unknown land. Thus came and went the last of the cannibals. The religion of the Hawaiians was a system of idolatry based upon certain meles, or song stories, which had been handed down from generation to generation, and preserved with integrity by the priests, who met at the heiaus and recited —the older to the younger—the "articles of belief," the traditions of Church and State. But, says a recent writer, "How did the Hawaiian priesthood become possessed of the story of the Hebrew Genesis ?" In 1794 Kamehameha, chief of Hawaii, succeeded in conquering the entire archipelago, and it has been a "kingdom" ever since. The present queen, Liliuokalani, is the elder sister of the late king, Kalakaua, and the heir to the throne is the Princess Kaiulani-Lunalilo-Kalaninuiahilapalapa. The population at the time of Cook's visit was about 400,000 ; now it is only 95,000. The Hawaiian Islands are of volcanic origin ; on every island are vestiges of these phenomena, and extinct craters are scattered over the surface, differing in size from the giant "Haleakala"—the Palace of the Sun—on the island of Maui, to the "Punch-bowl" in the city of Honolulu. Of extinct craters Haleakala is doubtless the largest in the world ; it is 10,032 feet high, 23 miles in diameter, and nearly eighty miles

in circumference! This monster volcano has not been active within the memory of man. The summit is crowned with immense walls of scoriaceous lava and basalt, and there are two discharge ways, a mile and a half wide, which pass between rock walls over 2,000 feet in height. The interior is a large cinder field, containing cones 400 to 900 feet high. Mauna Kea (the "White Mountain"), on the island of Hawaii, is the highest point of land in the group; it is 13,805 feet above the sea. This has been an extinct volcano for centuries, but its ignipotent sister Mauna Loa (the "Long Mountain"), 20 miles to the south, has been very active within the last few years. Mauna Loa is 13,650 feet in height; and on a "shoulder," 20 miles to the east, is the active crater of Hale-mau-mau (the "House of Everlasting Fire"), or, as it is usually called, the volcano of Kilauea. There have been many eruptions of Mauna Loa from 1832 to 1887, but perhaps the most destructive was in 1868—the famous "mud-flow." The earthquake destroyed nearly all the villages in the district; the tidal wave, 20 feet high, washed along the shore, doing immense damage, and the flow from the mountain carried away cattle, horses, sheep, and human beings; 81 lives were lost. In 1881 there was another great eruption, and the fiery lava travelled for 30 miles (in nine months), and stopped within three-quarters of a mile of the town of Hilo, a place of about 6,000 inhabitants! Property was very cheap there at that time. During the eruptions of January, 1887, "618 earthquake shocks were counted" in two days. Prof. Dana, in his "Characteristics of Volcanoes," tells us that "the origin of Volcanic heat, the source of lava columns beneath the volcano, the cause of the ascensive force in the lava column, are subjects on which science has various opinions and no positive knowledge." Volcanoes may be "explosive," either when water gains access to the interior (*i.e.*, liquid lava) and generates enormous projectile force, or they may be subordinate or "lateral," coming from the side of a mountain; there may be earthquakes in connection with the eruptions or the vibrations may scarcely be felt. Volcanoes eject lava (melted rock); projectile discharges which become cinders, ashes, and, if very large, they are called "lava bombs"; and gaseous discharges. But the pictures which show flames issuing from a crater are misrepresentations; the fiery glow is the reflection on the vapour from the liquid lava within the crater. Around the Hawaiian volcanoes are large deposits of sulphur; the natives place carved boxes, trays, etc., beside the fissures until they become encrusted a bright yellow.

After giving numerous quotations from authorities on the subject of volcanic phenomena, Mr. Howell described his visit to the crater of Kilauea, and his descent into the crater of Hale-mau-mau, in October of

last year. The latter crater is very active; it is half a mile in diameter, and 250 feet deep from the "floor" of Kilauea, and in this awful fiery chasm the waves of liquid lava are continually moving—irresistibly drawn to the centre, the seething whirlpool, where masses of lava are fused like blocks of sealing wax, and where great fountains of brilliant lava are hurled high up in the air! Kilauea is 300 miles from Honolulu, and the volcano is 4,000 feet above the sea-level. It took the travellers over an hour to climb the lava field of Kilauea, and nearly two hours were occupied in descending and returning within the crater of Hale-mau-mau.

TWELFTH MEETING.

Twelfth Meeting, 6th February, 1892, the President in the chair.

Donations and Exchanges since last meeting, 42.

The President laid on the table a list of contributions to Geology and Mineralogy, published in the Journal and Proceedings of the Canadian Institute, and prepared for the Committee on the Bibliography of Geology appointed by the International Congress of Geologists.

The following resolution was passed, on motion by Professor Macallum seconded by Dr. Shaw:—

"Whereas the attention of the Institute has been directed to the great danger threatening the orchards, and peach orchards in particular, in this province from the disease known as the 'yellows,' which has in former periods within the last century devastated large tracts of orchard lands in the neighbouring portions of the United States;

"And whereas scientific investigation has been partially made, and is now being carried on by some learned members of the said Institute into the causes of the said disease, with a view to find out some remedy and the best means of applying the same;

"And whereas the Legislature of the Province of Ontario passed an Act in 1881, which was amended in 1884, the special sections of which are:—

"Revised Statutes of Ontario, 1887—under noxious weeds and diseases affecting fruit trees:—

"Sect. 2, div. 3.—To cut down and burn any peach, nectarine or other trees on the land infected with the disease known as the 'yellows,' and to destroy all the fruit of the trees so affected.

"Sect. 3, div. 2.—Such council may and upon a petition of 50 or more ratepayers shall appoint at least one inspector to enforce the provisions

of this Act in the municipality and fix the amount of remuneration, fees or charges he is to receive for the performance of his duties; and in case a vacancy shall occur in the office of inspector it shall be the duty of the council to fill the vacancy forthwith.

"Sect. 8.—If written complaint be made to the inspector that yellows or black-knot exist within the municipality, in any locality described in such complaint, with reasonable certainty, he shall proceed to examine the fruit trees in such locality and if satisfied of the presence of either disease he shall immediately give notice in writing to the owner or occupant of the land whereon the affected trees are growing, requiring him within five days from the receipt of the notice to deal with such trees in the manner provided by Sect. 2 of this Act.

"Sect. 10.—Deals with the penalties, which are not under $5 nor more than $20 for not removing such trees, and for selling fruit so affected also same penalty.

it is the opinion of the Institute that the said Legislation is more permissive than compulsory and not sufficiently stringent to effectually stamp out the disease. Therefore, be it

"Resolved, that the attention of the Government of the Province be drawn to this important question, and that it be respectfully requested to give its most favourable consideration to the introduction of such more stringent legislation as shall enforce the destruction of infected trees, prevent the sale of diseased fruit, and regulate the appointment and duties of inspectors in such manner and with such powers as shall enable them to enter all orchards in their district at all times to enforce in full the provisions of the said legislation, and that copies of this resolution be sent to the Hon. the Attorney-General, and to the Hon. Minister of Agriculture."

Mr. J. C. Hamilton, LL.B., read a paper on "The Great Centre—an Astronomical Study."

Mr. Lumsden thought that if there was a star that, on account of its size, would be likely to be the centre of the universe that star would be Arcturus. It was stated to be the largest star we have any knowledge of. Its diameter would reach from the sun to the earth.

The President said the theory of a central star was very fascinating, but he had never read or heard of anything in Astronomy to confirm the idea.

THIRTEENTH MEETING.

Thirteenth Meeting, 13th February, 1892, the President in the chair.

Donations and Exchanges since last meeting, 54.

The death of Dr. T. Sterry Hunt, the eminent chemist and geologist, and author of several valuable works, was announced. Dr. Hunt had been for a long time connected with the Canadian Institute as a life member, and a copy of his recent work on "Systematic Mineralogy based on a Natural classification" had just been received from him as a present to the Institute.

Dr. George Kennedy read a paper by Prof. Campbell, Montreal, on "Siberian Inscriptions." It was not only a review of the volume of inscriptions from the Yenesei published by the Arehæological Society of Finland, but an actual attempt to decipher these hitherto unread relics of ancient literature by means of more accurate copies obtained by the writer from St. Petersburgh. The language they yield is Japanese, and it is the contention of Prof. Campbell that the authors of the inscriptions, mounds, and other remains of old civilization found throughout Southern Siberia were the Japanese in north-eastward migration from India, whence some of their own historians have derived them. The samples of inscriptions contained in the paper, which was illustrated by fac-simile drawings of the documents, plainly betray their origin as the work of Buddhist priests, and are dated from the time of Gautama's death. The oldest so far belongs to the fifth century, A.D., and is the memorial of Sekata, the Sagoteno of Japanese, and the Shekingtang, or Sheketang, of Chinese historians. The inscriptions submitted are but specimens of a large number to be published, along with Indian, Buddhist, and American mound-builder relics, in Prof. Campbell's forthcoming work, "The Eastern Track of the Hittites." Should his readings stand the test of criticism the light they will shed upon the history of the Khitan dynasty of China and of the peopling of north-eastern Asia and the western coast of America will open up a record of novel and absorbing interest.

Mr. Harvey said that the true opinion according to the best authorities was that the Etruscan people were subject to the Kabyle race. The Kabyles had ruled over Etruria for a couple of centuries. The language of the Etruscan inscriptions was taken from the Kabyle country. Prof. Campbell would have to reckon with these authorities. The Accadians were Mongols and had attained a very high civilization.

FOURTEENTH MEETING.

Fourteenth Meeting, 20th February, 1892, the President in the chair.

Donations and Exchanges since last meeting, 92.

The following resolution was adopted :—

"The Canadian Institute has received the intimation of the death of Dr. T. Sterry Hunt, F.R.S. &c., a life member of the Institute, with profound regret. In the long period in which Dr. Hunt was connected with the Institute, he contributed many valuable original contributions to its publications. The Institute, in common with all other scientific corporations, recognises the immense advantages derived from the assiduous labors and investigations in the fields of geology and mineralogy, which have rendered the name of Dr. Hunt famous in both hemispheres, and the Institute tenders to his sorrowing relatives the most respectful expression of sympathy in their present bereavement."

It was resolved on motion by Mr. Macdougall, seconded by Prof. Macallum:—

"That a circular be printed and sent to the societies exchanging proceedings with us, mentioning the volumes of their publications we require to complete our sets, and requesting them to aid us by supplying missing numbers; also asking them who thus favor us to state which of our publications they may not have in their libraries, and promising to send them as far as we are able; that the Librarian be asked to report to the Council a list of those societies to whom this circular should be addressed, and the numbers of their proceedings wanting on our shelves."

Mr. Boyle presented the Annual Archæological Report.

Dr. Sandford Fleming read a paper on "Electoral Representation and the Rectification of Parliament."

At the close of the paper the President read the following:—

"A friend of the Institute, deeply impressed with the great national importance of the subject dealt with in Mr. Fleming's communication, has offered (without wishing his name to be known) to place at the disposal of the council the sum of $1,000 to aid in obtaining a satisfactory solution of the problem referred to. The willing donor suggests that the sum (in whole or in part) may be awarded by the Institute for the best workable measure which, if made law, would give the whole Canadian people equal representation in Parliament, and each elector due weight in the Government through Parliament."

Prof. Ashley made various objections to the plan proposed by Dr. Fleming. With all its defects party government does furnish a tolerably fair basis for government Under any other system it would be difficult to secure the adherence of sufficient numbers to carry out measures of importance. The plan of minority representation proposed by Hare was altogether a curiosity and was outside the range of practical politics

He was present at a meeting in Oxford when the matter was taken up. It was universally pronounced chimerical.

Mr. Douglass, while aware of many difficulties in the carrying out of a system of minority representation was strongly in sympathy with the paper to-night. He wished for further information on the subject.

Mr. Meek urged the advantages of Party Government. With all its faults and shortcomings it is after all (taking into consideration the true objects of all governments), the best system of government the world has had any experience of. Party government is not an invention or creation. It is a natural growth, a natural development. Theorists may propound theories of government which appear more symmetrical, but not having sprung spontaneously from the people, they lack vitality. A tree may be constructed which will appear more artistic in form, and more beautiful in outline than a living tree, but the one is dead, and the other has life. We should not seek to destroy representative party government as it now exists, but to improve it, and remove its real defects. Wherever we find free institutions, wherever we find political liberty, there we find party government in some form. Wherever we find despotism, wherever political liberty is suppressed, party government does not exist. They have no political parties in Russia or Turkey. There is no political life in those countries. Our present methods of representatative government are modern, but party government existed in the cities of ancient Greece. The moment a city acquired free institutions, party government naturally and necessarily came into existence As soon as free institutions were done away with, party government ceased. The same thing happened in Rome. While Rome retained a real republican government, different parties contended with each other for the supreme power, and Rome was aggressive, and progressive. When imperial military authority became established, party government ceased, party strife ceased, and progress and civilization became stagnant. Our aim should be to improve, not to destroy. The contention of party leaders is not so much energy and talent wasted. Their struggles prevent political stagnation. They educate the people. They are the life of free institutions. Minorities are not without representation, they are represented by the opposition. All parties necessarily and naturally consolidate into two, representing the ins and outs. Party government and representative government, as we now have them, have many defects which can be reformed and corrected. Our senate might be reconstructed. Our voters' lists might be simplified. The limits of the constituencies might be settled or adjusted so as to prevent any politica party from altering them to suit its own purposes. But, the greatest of

all improvements must be brought about by educating the voters to cast their ballots, not blindly in favour of the political party to which they may have become attached, but rather in favour of the best men, and the best measures. In other words intelligence and patriotism should be cultivated. Then as to the offer of "a friend of the Institute, to place at the disposal of the council the sum of $1,000, to be awarded by the Institute for the best workable measure to give equal representation in parliament to the whole Canadian people, and each elector due weight in the government through parliament," I would say it seems to me that "equal representation of the whole Canadian people in parliament" is not the most important thing to be attained. Equal representation means that the most ignorant, prejudiced, superstitious and vicious in the community would have the same voice and an equal right in choosing representatives that the most educated, intelligent, enlightened and moral person would possess. The object of government should be rather to prevent the ignorant, the superstitious, the vicious, the prejudiced and the immoral elements from having equal weight and equal influence. All classes, all persons, all societies, all beliefs and all interests should not be represented. The objects of government are to give the greatest power and influence to the most intelligent, the most progressive, the most industrious, the most enterprising and the best elements in the community. A good government is one which not only preserves order in the community but which develops, promotes and stimulates industry, invention, progress, intelligence—in short, a higher civilization. What would or might call for useful essays and treatises would be a prize offered, say for the best essay or treatise on "improvements in representative parliamentary government," or, suggesting "practical improvements in our present system of party government," or, "treaties showing the defects and imperfections in our present systems of representative parliamentary party government," and, "suggesting remedies for the evils pointed out, and such amendments and improvements as the system is capable of."

The following resolution was then adopted by the meeting :—

"That the best thanks of the Institute be tendered to the friend, who does not wish his name to be known for his generous offer, in contributing the sum of $1,000 to aid in obtaining a satisfactory solution of the problem referred to in Dr. Sandford Fleming's paper; that the Institute accepts the offer and empowers the council to take the necessary steps to obtain essays or treatises, and award the premium to the best workable measure which, if made law, would give the whole Canadian people equal representation in the Government through Parliament, and each elector due weight in the Government through Parliament."

FIFTEENTH MEETING.

Fifteenth Meeting, 27th February, 1892, the President in the chair.

Donations and Exchanges since last meeting, 53.

H. H. Langton, B.A., and Alexander Primrose, M.B., were elected members.

A communication was read from the secretary of the Lincoln's Farmers' Institute, enclosing a copy of a resolution adopted by that body at its meeting in Niagara on the 23rd instant, respecting diseases of fruit trees. After referring to a resolution adopted by the Canadian Institute on the subject of the inefficiency of the present law regarding the diseases of fruit trees, and stating that the general principle of such resolution appears to be in accord with the views of the meeting, it was resolved that a committee of three fruit-growers of the County of Lincoln be appointed to co-operate with a committee of the Canadian Institute for the purpose of drafting such amendments as will make the working of the present law more effective, and in urging the Legislature to take action in this matter at its present session. The committe is composed of James Sheppard, of Queenston ; Lucas Woolverton, of Grimsby, and Roland W. Gregory, of St. Catharines.

Capt. Ernest Cruikshank read a paper on " Early Traders and Trade Routes in Ontario and the West." The paper began by a reference to the fact that from 1763 to 1816 the trade not only of Western Canada but of the entire American North-West, including the present States of Illinois, Iowa, Wisconsin, and Minnesota, was conducted by British merchants from Montreal. The French trading posts were enumerated, and the extent of their commerce with the Indians was briefly sketched as it existed about the year 1754, just previous to the outbreak of the war which terminated in the conquest of Canada by the English. The old canoe routes from Montreal to the upper lakes, from Lake Erie to the Ohio and the Wabash, from Lake Michigan to the Illinois and Mississippi, and from Lake Superior to the Canadian North-West were next described, as well as the distribution and numbers of the Indian tribes living in the vicinity of those rivers, and the condition of French settlements in the West at the date of the conquest. The beginning of British commerce was traced. Alexander Henry was selected as a type of these early traders. A summary was given of his travels from 1761 to 1776, and of an unsuccessful attempt to work the copper mines of Lake Superior in 1770 and 1771. Notice was taken of the explorations of Carver, Rogers, and others in the direction of the Mississippi, and of the success of the Frobishers and their associates in penetrating from Lake

Superior to Lake Winnipeg and the Saskatchewan valley, and discovering trading stations unknown to the French. The trade of Mackinac, Detroit, and Niagara, and other stations at the beginning of the American revolution, the character of the traders and their relations with the Indians, were next considered in the light of unpublished documents, from which copious quotations were made. The effects of the war were instanced, and a general review taken of the state of the Western trade during this period. Some account was then given of the variety of goods required for the business and the value of the returns, and in conclusion the writer advocated the preparation of a historical map of Ontario and the Canadian North-West.

SIXTEENTH MEETING.

Sixteenth Meeting, 5th March, 1892, the President in the chair.

Donations and Exchanges since last meeting, 62.

Prof. Macallum, J. B. Williams, and J. G. Ridout were named to meet the Minister of Agriculture with the deputation from Lincoln and Niagara on the diseases of fruit trees.

A communication was read from the Imperial Russian Society of Geography announcing the death of the President His Imperial Highness the Grand Duke Constantine.

C. G. Horetzky was elected a member.

Mr. W. D. Stark read a paper on "The History of Greenland and Iceland," giving a short description of the coasts of Greenland and Iceland, noting some facts concerning the antiquity of the islanders. Their manners, habits, and modes of livelihood were touched upon, including some account of the animals useful to the inhabitants of those desolate regions.

The President, Mr. Arthur Harvey, then read "Rutherford's Narrative —An Episode in the Pontiac War, 1763—an unpublished manuscript with introductory notes by Mr. Harvey." This graphic and interesting narrative of the capture and enslavement of Lieut. Rutherford, an officer of the "Black Watch," by the Indians of Detroit in 1763 was presented by the narrator's grandson, Colonel T. W. Rutherford, of the Madras Staff Corps, late commandant at Delhi, India, to Mr. Thomas Hodgins, to be used as he saw fit. Mr. Hodgins presented it to the Institute, for which a vote of thanks was tendered to him.

SEVENTEENTH MEETING.

Seventeenth Meeting, 12th March, 1892, the President in the chair.

Donations and Exchanges since last meeting, 53.

The following were elected members :—Prof. Ashley, R. W. Spence, Lancelot Middleton, C.E., and James T. Locke.

The President gave a report of the interview of the deputation on "Peach Yellows" with the Minister of Agriculture.

The following resolution was adopted :—

"1. That special investigations into the cause of the disease known as 'Peach Yellows' have been made by Dr. W. R. Shaw, a member of this Institute.

"2. That a committee of the Institute has waited upon the Provincial Government, with whom appeared also representatives of the Lincoln Farmers' Institute, the Niagara District Fruit Growers' Association, and of the Ontario Fruit Growers' Association.

"3. That this deputation asked for amendments in the existing laws on the subject, and had a very favorable reception.

"4. But that one cause of infection appears to be the introduction of young trees from the United States, grown from 'pips' from infected fruit, and that such young trees, if they come to maturity so as to bear fruit for a year or two, must in the end succumb to the disease and be the means of contagion to other orchards.

"5. That the Institute therefore prays for the enactment of a law to prevent, under proper regulations (to be made by the Governor-General in Council), the importation of any peach trees or other young fruit trees unless a clean bill of health accompany, to certify that no disease exists in the districts from which such young trees come, with a proper guarantee that no disease is inherent in such young stock, in the same way as enacted by the State of California and other places interested in maintaining the integrity of their orchards.

"6. That the Secretary be instructed to send a copy of this resolution to the Department of Agriculture at Ottawa, with copies of Dr. Shaw's paper.'

Mr. H. Rushton Fairclough, M.A., read a paper on "Lieut.-Col. Coffin and his private correspondence during the rebellion of 1837." He pointed out that the subject of his paper (Wm. Foster Coffin) was the son of a major in H. M. 15th Regiment of Infantry, and grandson of a distinguished U. E. Loyalist, to whom General Sir Guy Carleton attributed much of

the credit of saving Quebec when assaulted by Arnold and Montgomery. After giving a short account of the Colonel's movements until 1873, when the Department of the Interior was organized, and he (the Colonel) was promoted to the position of Commissioner of Ordnance and Admiralty Lands, which he held up to the time of his death, in 1878, the paper enumerated the important special offices to which he had been appointed. The correspondence to which Mr. Fairclough called attention covers a period of over six years (1834-40). The letters, twenty-six in all, were written to Colonel Coffin's cousin, Mrs. Grant, afterwards Baroness de Longueuil, and her daughter, now Mrs. J. A. Allen, of Alvington, Kingston, for some years the residence of the Governors-General of Canada. Besides the family and social gossip given in the letters, there is a great deal that must be interesting to Canadians in general, and it is chiefly the writer's free-spoken comments on the exciting political events of the day that Mr. Fairclough brought before the Institute. The first letter in the packet gives a most vivid description of the burning of the Chateau de St. Louis at Quebec on January 23rd, 1834. This castle had been used as the residence of the Governors of Canada for upwards of 150 years. It was never rebuilt. The characteristics of the commissioners appointed in 1835 by Lord Melbourne are humourously described. The Earl of Gosford, Sir Charles Grey, and Sir George Gibbs were known as the three G.'s, gander, goose, and gosling. The conflict in Upper Canada between "His Jockeyship" Sir F. B. Head and the Assembly, the deadlock in 1836 in Lower Canadian politics, the party dissensions of the day, and the racial character of the strife in Quebec, are dwelt upon at length by Colonel Coffin. The earlier incidents of the civil war—the repulse of the troops at St. Denis, Wetherell's victory at St. Charles, and the brutal murder of Lieutenant Weir are all recorded, but what is most worthy of publication is the remarkably vivid description given by the writer as an eye-witness of the battle of St. Eustache. Colonel Coffin characterizes, in a most pointed and vigorous manner, the aristocratic Whig lord, the Earl of Durham, who, in May, 1839, arrived in Canada as "Her Majesty's High Commissioner for the adjustment of certain important affairs affecting the provinces of Upper and Lower Canada." A high eulogy is passed upon this distinguished man, who in the short space of five months investigated and determined the causes of dissension in these provinces, and whose report is one of the most valuable documents ever written upon colonial affairs. Many a tribute of affection and respect is paid to the honest soldier Sir John Colborne. Though these letters add but few historical facts to those already recorded, still nothing could better enable Canadians to realize vividly the state of their country in

those critical years, 1834-40, than a perusal of this interesting correspondence.

Mr. Bain referred to the series of papers on Lower Canada published last year in the Montreal *Star*, and urged the importance of collecting and preserving historical documents such as that read this evening, as the principal characters were fast passing away.

EIGHTEENTH MEETING.

Eighteenth Meeting, 19th March, 1892, the President in the chair.

Donations and Exchanges since last meeting, 59.

Messrs. Howland and Macdougall were appointed to attend a meeting of the Ontario Artists' Association with the Government and the University authorities respecting the preservation of the old U. C. College buildings and grounds for art, science and literature.

Messrs. Clark and Ridout were named auditors for the year.

It was decided to call a special general meeting for the 9th April next to consider certain amendments to the regulations proposed by the Council.

A vote of thanks was passed to Drs. Susanna Boyle and Letitia K. Meade for their services in the work of craniometry for publication in the last archæological report.

Mr. J. W. L. Forster read a paper on "Nineteenth Century Sacred Art." After quoting authority to show that no such art exists in this age, he made a review of the rise of the art in the middle ages and the causes that led to it. Turning to the spirit of this age and its effect upon art, he said that the art of to-day exhibited less of the adornment and precision of the conventicle, and more of the pathos of the soul that has learned for itself the meaning of suffering, right down in the throbbing populations of the world.

Mr. Harvey had made the statement at the reading of a former paper that sacred art has become impossible. Mr. Forster does not meet this question in the spirit the statement was made. He evades the question by introducing a new definition which was not the common one. He questioned very much whether religion was at all artistic. It seemed to him that the tendency in religion was to consider moral and religious questions without the aid of art, and it was better so to consider them. Mr. Forster had made the remark that art flourished more when the people were illiterate. It was the object of the art of the middle ages to educate

the people, hence sacred subjects were placed on the stage. He considered the pictures of to-day simply figure pictures; they were not meant for incitements to faith.

A paper on "The Southwold Earthwork and Country of the Neutrals," by Mr. Coyne, was read by Mr. David Boyle. The paper dealt very fully with accounts of the almost forgotton race of Neutrals, described the country where they lived, their manners, habits, and race. They formed part of the great Huron-Iroquois family, and their territory embraced the whole of South-Western Ontario from Lake Huron to the Niagara river. The paper also gave an account of the work of the missionaries with the Neutrals, and in fact nearly all the knowledge obtained regarding them came through the missionaries.

NINETEENTH MEETING.

Nineteenth Meeting, 26th March, 1892, the President in the chair.

Donations and Exchanges since last meeting, 58.

Walter M. Rutherford and George E. Musson were elected members

The Council was instructed to take all necessary proceedings to have the Institute properly represented at the meetings to commemorate the centenary of the first parliament of Upper Canada.

Dr. George Kennedy read a paper by Mr. G. S. Wilgress, B.A., on the "Game Laws of Ontario." The writer stated that since he volunteered some four months ago to read a paper on the subject of "The Game Laws of Ontario," much had been done towards State protection of the animals known as game, as is seen in the bills now before the Ontario House of Assembly to amend the Act for the Protection of Game and Fur-bearing Animals, and to amend the Act to Encourage the Destruction of Wolves, which doubtless embody the changes recommended in the excellent report of the Fish and Game Commission recently issued. The Forest park which it is proposed to establish in the district of Nipissing will also prove a valuable means of preserving game. The writer then dwelt at some length on the deer, the different methods of hunting them, and their enemies, which he classified as men, dogs, and wolves, the latter being by far the most destructive. The paper closed with an account of the moose or elk. Considering not only the value of the hide, but also that of the head and meat, he thought that the penalty imposed at present of from $10 to $50 was certainly not large enough to deter pot-hunters from killing the animal, as they would

lose nothing after paying the fine, provided they could succeed in smuggling the carcase away so as to be able to sell it to advantage.

After the reading of the paper, the sale of last year's periodicals took place.

TWENTIETH MEETING.

Twentieth Meeting, 2nd April, 1892, the President in the chair.

Donations and Exchanges since last meeting, 72.

Rev. Philip Tocque read a paper on "The Phocas of Terreneuve," a description of the seal fisheries of Newfoundland. A paper on "An Animated Molecule and its Nearest Relatives," by Dr. Daniel Clark, was read by Dr. George Kennedy.

TWENTY-FIRST MEETING.

Twenty-first Meeting, 9th April, 1892, the President in the chair.

Donations and Exchanges since last meeting, 71.

Mr. D. W. Beadle read a paper on "Canadian Wild Flowers."

Mr. Macdougall wished that a copy of the paper could be placed in the hands of every one of the school children of the city. It would excite an interest in the study of our wild flowers.

Mr. Noble thought that the subject that had been taken up was of interest to everybody, not as some of the papers read before the Institute, that were of interest only to some particular persons. In regard to High Park, he was glad that he had been one of those who had taken an interest in the preservation of its wild flowers and shrubs. Their efforts were successful so far as to prevent the wholesale laying waste of the wild flowers. In regard to the burning of High Park, he was very sorry to say that they had not been successful. Some plants that strike their roots deeper than others were not injured. He hoped that the practice would be discontinued.

Mr. L. J. Clark had no doubt that the School Board would be to the expense of placing a copy of the paper read in the hands of every teacher.

Mr. Armstrong spoke of the extensive destruction of the wild flowers. Every season we saw people digging them up and carrying them away, which was utter destruction; they may as well have been burned. Some beautiful flowers had entirely disappeared. With regard to High

Park he did not expect any improvement till an intelligent gardener was placed at the head of affairs.

The meeting was pursuant to notice constituted a Special General Meeting to consider certain amendments to the regulations proposed by the Council.

The amendments were considered, and the regulations as amended were consolidated and adopted as follows, to come into force on 1st July, 1892 :—

REGULATIONS OF THE CANADIAN INSTITUTE.

(Consolidated and amended, 1892.)

SECTION I.

OF MEMBERSHIP, ELECTIONS, AND FEES.

1. The Canadian Institute, established under Royal Charter, November 4th, 1851, shall consist of Ordinary, Honorary, Corresponding, Life, Junior, and Associate members. All persons who are desirous of forwarding the objects of the Institute are eligible to membership.

2. Persons wishing to be admitted as Ordinary members must be proposed at least one week before election, in accordance with a form of application given in Form A, to be obtained from the Secretary. The election shall be by ballot, and the proportion of votes requisite for admission not less than three fourths of the votes cast. Provided that during the recess, *i.e.*, between May 1st and November 1st, the Council (as hereinafter constituted) shall have power to elect members by the unanimous vote of those present at any meeting.

3. Persons under the age of 21 years may become Junior members. They shall not be subjected to election as above, but must be recommended by two members, in writing, according to Form B., and such recommendations shall be delivered to the Secretary, and transmitted to the Council for approval or rejection. On approval, the recommendation shall be signed by the Chairman, and the candidates shall be admitted. On their attaining the age of 21, they may apply to the Council for transfer to such other class of membership as they may desire.

4. Honorary members shall be persons eminent for their services to science and literature, and their number shall be limited to twenty-five, of whom not more than ten shall be residents of Ontario. They must be recommended by at least three members, who shall state the reasons for their recommendation, in writing, such recommendation to be transmitted through the Secretary to the Council. If approved, it shall be signed by the Chairman, and read at the next ordinary meeting, previous to the ballot being taken.

5. Corresponding members shall be persons who have shown interest in the

work of the Institute, or who have made or are likely to make contributions to the Proceedings or donations to the library, museums, etc. They shall be elected in the same way as Honorary Members for a term not exceeding five years. The number from the Province of Ontario shall not exceed ten.

6. Associate Members shall be those who wish to take special interest in portions only of the work of the Institute. They shall be admitted in the same way as Ordinary Members.

7. Associates and Junior members shall have all the privileges of membership, except the right of voting, holding office, taking part in the business management of the Institute, and receiving copies of its publications.

8. Honorary and Corresponding members shall have every privilege of Ordinary membership except that of holding office.

9. The annual fee or subscription shall be :—For Ordinary membership $5.00. For Junior membership $1.00. For Associate membership $2.00. Provided that no change shall be made in the subscriptions of members elected prior to 1st July, 1892.

Every Ordinary, Junior or Associate Member shall be liable to continued payment of the annual subscription until he has signified, in writing to the Secretary, his withdrawal, and paid all his dues to that date, when his liability shall cease. But any Ordinary Member not in arrears may compound for future subscriptions, and become a Life member on payment of $50.00.

The Secretary shall inform each candidate of his election by sending Form C. (appended), and if he fail to pay the proper fee within one month, the election shall become null, and no re-nomination shall be made unless accompanied with the said fee. Until the payment of the fees no person shall enter into the privileges of membership.

Any person elected after the 31st of March in any year shall be called upon to pay only a *pro rata* fee until December 31st next ensuing, but if such election be after the 30th September, he shall pay the subscription for the next year at the same time as the *pro rata* amount for the current year. All subscriptions shall be due for renewal on the first day of January (in advance).

Ordinary members who reside more than ten miles from the General Post Office in the City of Toronto shall be called upon to pay only $3.00 as their annual fee.

Any member whose annual subscription shall be six months in arrear shall be reported to Council on the first Monday of July, and unless the Council shall otherwise decide, shall be suspended from membership, and shall be notified of such suspension; but such member may be re-instated within the year upon payment of arrears.

At least fourteen days previous to the annual election in each year, the Secretary and Treasurer shall prepare and sign a roll of the names and addresses of members who have paid their subscriptions, and are in good standing. Such roll, which shall be subject to correction by the Council only, shall be hung up in the Reading Room, and only those whose names appear on it shall be entitled to vote or hold office.

The Council shall have power to remit the annual subscription or arrears thereof in case of a member who, from ill health, advanced age, or other sufficient cause, is unable to pay the same, or to accept from him in lieu thereof any manuscripts, books, drawings, models, or specimens which are in their opinion valuable to the Institute. But each case must be considered and reported on by a committee of Council appointed for such purpose.

10. If any complaint is brought against a member, the charge shall be in writing, signed by the complainant, and shall be considered by the Council, and opportunity given for a reply. If the Council deem it desirable, they may then call a special general meeting for the consideration of the matter at issue, of which not less than a week's notice shall be given, and if two-thirds of the members present at that meeting are of opinion that such member should be expelled, the officer presiding thereat shall pronounce his expulsion, and the fee paid by the member for the current year shall be refunded to him.

11. For the study of special branches of Literature, Science, and Art, members may group themselves into such Sections as the Council may from time to time approve, subject to the ratification of the Institute at any of its ordinary meetings. Each Section shall form its own regulations and by-laws, but subject to the sanction of the Council, to whom they shall be transmitted for that purpose. Associate members who join any Section may vote and hold any office therein, except that of Chairman, and take part in all its proceedings.

SECTION II.

OF THE OFFICERS AND COUNCIL, AND THE MODE OF THEIR ELECTION.

1. At the annual general meeting, which shall be held on the first Saturday in May (unless that day falls upon a holiday, and then on the following Saturday), there shall be elected a President, two Vice-Presidents, a Secretary, a Treasurer, an Editor, a Librarian, a Curator, and six other members to form the Council.

2. The election shall be confined to those nominated for such positions at the last ordinary meeting in April, but any one nominated to an office, and not elected thereto, shall be eligible as a Councillor without office.

3. Election shall be by ballot, and the Chairman shall appoint two Scrutineers to receive and examine the votes, and report them to him for a declaration of the result.

4. The officers above named shall first be balloted for by separate ballots, in the order mentioned, and one ballot shall thereafter be taken for members of the Council without office. If in any case the votes are equal, the decision shall be by ballot.

5. Each Section shall elect its officers at the meeting of the Section last preceding the annual meeting of the Institute above referred to. If there are ten members of the Section present thereat, or if during the session the Section shall have held three meetings, each attended by ten members, the Chairman elected at such meetings shall be thereby held to be nominated as a member of the Council, in terms of Clause 1 of this Section, but not otherwise.

The new Council shall enter upon their duties on the Saturday following their election.

SECTION III.

OF THE AUDITORS.

Two Auditors shall be appointed at the last ordinary meeting in March of each year; one by the members, the other by the Chairman at that meeting. They shall audit the accounts of the Institute for the year, and present their report to the Council at least one week before the annual general meeting.

SECTION IV.

OF THE COUNCIL.

1. The Council shall meet at least once a month during the session, or oftener if necessary.

2. Any two members of the Council may, by letter to the Secretary, require a special meeting to be called, and two days' notice of such meeting must be given to each member of the Council.

3. At any meeting of the Council five members thereof shall constitute a quorum.

4. The Council shall have power to appoint committees for special purposes, and such committees shall report to the Council.

5. The Council shall present at the annual general meeting a report on the state of the Institute, in which shall be given an abstract of all the proceedings, and of the receipts and expenditures, during the year ending March 31st next before such meeting.

6. In the event of any office becoming vacant before the annual general meeting, by death or otherwise, the Council shall have power to fill the vacancy; and in the event of any officer being unable to perform his duties, the Council shall have power to relieve him from their performance, and appoint another to act in his stead.

SECTION V.

OF THE DUTIES OF OFFICERS.

1. The President shall have the general direction of the affairs of the Institute subject to the Regulations, preside at all meetings of the Institute or the Council at which he is present, and regulate and keep order in the proceedings.

2. The Vice-Presidents shall (in the order of their precedence) discharge these duties in the absence of the President.

3. In the absence from any meetings of the President and Vice-Presidents, the members present may elect one of their number to take the chair.

4. The Treasurer shall receive for or on account of the Institute all moneys payable to it, keep an account thereof, and deposit them forthwith in one of the Banks in the city of Toronto to the account of and for the use of the Institute, unless otherwise ordered by the Council. No money shall be paid out except by order of the Council.

5. The Secretary shall keep the seal of the Institute and send out the notices provided for in these Rules. He shall take minutes of all the proceedings of the Institute and of the Council, enter them in proper books, and read at each meeting the minutes of the previous meeting. Subject to the direction of the Chairman he shall bring before the meeting all business matters according to the order established in these regulations and conduct the correspondence of the Institute.

6. The Secretaries of Sections shall perform the like duties for their respective Sections, and shall, on or before the 20th day of April of each year, present to the Council a report on the work done by their Sections and the list of their members during the past year. If no such report be made, or if a Section have not held at least two meetings during the year, it shall, *ipso facto*, cease to exist.

7. An assistant Secretary may be appointed by the Council, who shall hold office during their pleasure. They shall define his duties and fix his remuneration.

8. The Editor shall have charge of the publication of the Transactions of the Institute in conjunction with an Editing Committee to be nominated by the Council from among its members at the first meeting thereof after the Annual meeting. All papers or abstracts of papers read before the Institute and intended for publication shall be handed to the Editor at the close of the meetings at which they are read, or as soon as possible thereafter, and the decision as to publishing any paper shall rest with the Editing Committee.

Every report of any Section, Committee or officer of the Institute shall be made to the Council and approved by them before publication.

9. The Librarian shall have the care of all books, documents, plans, drawings,

and the general superintendence of the same, under the direction of the Council. He shall keep a list of all donations to the library, and report them to the Council.

10. The Curator shall have charge of the museums and of all models and specimens deposited therein, and the general superintendence of the same, under the direction of the Council. He shall keep a list of all contributions and contributors to the museums, and report them to the Council at the next meeting.

Assistant Curators may be appointed by the Sections, and shall assist the Curator in the care of the museums and the specimens contained in them so far as relates to their own departments.

SECTION VI.

OF MEETINGS.

1. The ordinary meetings of the Institute shall be held at such times as the Council shall direct, but may be changed by resolution of the Institute at any general meeting, after one month's notice. Until otherwise ordered, they shall be held at 20 o'clock on each Saturday from 1st November to 1st of May.

2. The ordinary meetings of Sections shall take place at the times agreed upon by those sections, with the approval of the Council.

3. Special meetings of the Institute may be called :—

(*a*) By the Council, giving six days' notice in writing, and sending the same by messenger or by mail to the last known address of every member.

(*b*) By the President, or, in his absence, a Vice-President, on being required so to do by at least twelve members. Such requisition must be in writing, specifying its object. The same notice should be given as in the preceding clause provided.

At such special meetings, twelve members shall constitute a quorum, and no motion shall be deemed carried unless there be such quorum present at the vote, and a majority vote in its favor.

4. Special meetings of Sections may be called by their Chairmen in any way authorised by their rules.

5. At the ordinary meetings of the Institute, the following order of business shall be observed as closely as circumstances will admit :—

(*a*) The minutes of the previous meeting shall be read, and after correction (if necessary) and approval, shall be confirmed by the signature of the Chairman, and no entry shall be valid unless this is done.

(*b*) Nominations of candidates for admission.

(*c*) Business arising out of the minutes.

(*d*) Communications and donations received since the last meeting.

(*e*) Communications from Council and from Sections. Reports from Librarian and Curator.

(*f*) Notices of motion.

(*g*) New business.

(*h*) Election of candidates. One ballot shall be taken for all the candidates proposed on the same day, but if negative votes appear, each candidate shall be separately balloted for under Section I., clause 2.

(*i*) The reading of papers.

(*j*) Discussion thereof and remarks thereon.

(*k*) Announcements.

SECTION VII.

OF BRANCH SOCIETIES.

On the petition of ten or more persons, members of the Institute, or desirous of becoming members, and resident in any city or town in Canada, other than Toronto, the Council may make arrangements (subject to confirmation by the Institute at a special meeting) for the establishment at such places of branches of the Institute, to be governed as sections are.

SECTION VIII.

OF THE PROPERTY OF THE INSTITUTE.

1. The control of the property and effects of the Institute shall be vested in the Council.

2. No papers, plans, maps, or other property belonging to the Institute, shall be taken out of the rooms thereof, excepting under the rules to that end made and provided, but every member shall have a right to inspect the same at such hours as the Council may appoint.

3. Every person desirous of bequeathing to the Institute any manuscripts, books, maps, plans, drawings, instruments, geological, botanical, or other specimens, natural curiosities, works of art or manufacture, real estate or personal property, is requested to make use of the following form in his will, viz. :—"I give and bequeath to the CANADIAN INSTITUTE, incorporated by Royal Charter, November 4th, 1851 *(here enumerate and particularize the effects or property intended to be bequeathed)*, and I hereby declare that the receipt of the Treasurer of the said Institute for the time being shall be an effectual discharge to my executors for the said legacy."

SECTION IX.

OF VISITORS.

Members may introduce their friends or strangers visiting the city to the meetings of the Institute or to the reading rooms and museums under such regulations as the Council may from time to time make, and the Institute approve.

SECTION X.

AGREEMENT WITH THE NATURAL HISTORY SOCIETY.

Nothing in these Resolutions shall interfere with rights enjoyed under a special agreement heretofore made with the Natural History Society of Toronto.

SECTION XI.

OF ALTERING THE REGULATIONS.

These Regulations shall come into force on the first day of July, 1892.

A motion to alter them may be made at the annual general meeting, or at a special general meeting called for the purpose, and not otherwise ; and notice of the proposed alteration shall be given at two consecutive ordinary meetings prior thereto.

APPLICATION FOR MEMBERSHIP.

[*Form A.*]

To The Canadian Institute:

I, the undersigned, proposing to become a of the Canadian Institute, do hereby promise that I will be governed by the Royal Charter and by the Regulations and By-laws of the said Institute, and I promise to promote its objects as far as shall be in my power, and to attend the meetings thereof as often as I conveniently can.

Witness my hand, this day of 189

.....

We, the undersigned, consider the applicant a fit and proper person to belong to the Canadian Institute.

Witness our hands.

..... } *Members of the Institute.*
..... }

[*Form B.*]

We, the undersigned, consider a fit and proper person to be a junior member of the Institute. He is years of age.

Witness our hands.

.... }
..... } *Date*.. .....
Members of the Institute. }

[*Form C.*]

CANADIAN INSTITUTE,

.....

SIR,—

I have the honor to inform you that you were duly elected (a member) or (Associate) of the Canadian Institute, on the day of and I beg to enclose a copy of the regulations.

The subscription for the current year, you will observe, is payable within a month of the date of your election. On your remitting the amount to the treasurer, all publications or notices to which you are entitled will be forwarded according to your directions.

I have, &c., &c.,

.....*Secretary.*

[*Form D.*]

CANADIAN INSTITUTE,

.....

SIR,—

I have to call your attention to Rule 9, Section 1, which provides that as your subscription was not paid prior to July 1st, inst., you are suspended from membership, but on payment of the same you will be re-instated.

I have, &c., &c.,

.....*Secretary.*

REGULATIONS OF THE LIBRARY AND READING ROOM.

Adopted at meeting of Council, February 1st, 1892.

---

1. Any member may obtain the loan of any periodical from the Reading-Room, not to exceed two numbers at any one time, for a period not longer than one week.

2. Periodicals shall not be loaned until they have been on the table one month in the case of monthlies and quarterlies, and one week in the case of weeklies.

3. Any member may obtain the loan of any exchange from the Reading-Room after it has been 14 days on the table, not to exceed two numbers at any one time, for a period not longer than 14 days, which may be renewed for further periods on presentation of the volume at the Institute, if in the meantime, no request for the same has been made by any other member.

4. Any member may obtain the loan of any book from the Library, not reserved under rule No. 11, not to exceed three volumes at one time, for a period

not longer than one month, which may be renewed for a further period of one month on presentation of the volume at the Institute, if in the meantime, no request for the same has been made by any other member.

5. Non-resident members may obtain the loan of periodicals, exchanges or books, by paying the postage both ways.

6. If any member retain a periodical or exchange from the Reading-Room or a book from the Library longer than the time specified, he shall be notified by the Librarian and shall return it at once. Any member failing to comply with this regulation shall forfeit his right to receive the Transactions of the Institute.

7. In case any book or periodical is injured or lost while in the possession of a member, it must be replaced by a perfect copy or an equivalent in money.

8. No book or periodical shall be removed from the Library or Reading-Room without the permission of the Librarian, and the presentation of a ticket signed by the applicant, who shall be responsible for the books, &c., taken out until such ticket is cancelled.

9. Any Member may introduce a friend, not resident in Toronto or vicinity, to the privilege of reading in the Library or Reading-Room for a period not exceeding one month, on entering his own name with that of the person introduced by him in a visitors' book to be kept for that purpose, such privilege not to be renewed until a period of six months shall have elapsed.

10. Any person not a member of the Institute engaged in any special scientific enquiry or research, may be allowed to consult the exchanges and books under such rules and regulations as the Council shall from time to time determime.

11. The Librarian shall reserve from public circulation such periodicals, books, engravings, drawings, plans and other documents for reference purposes, as the Council may from time to time determine.

TWENTY-SECOND MEETING.

Twenty-second Meeting, 16th April, 1892, the President in the chair.

Donations and Exchanges since last meeting, 43.

George W. Grote was elected a member.

A paper by Rev. Dr. MacNish on "Celtic Prosody" was read by Dr. George Kennedy. The paper, after alluding to the important place held in Celtic literature by poetry, dwells upon the contrast between Greek and Latin verse and Celtic verse, the scansion of the one depending on quantity, that of the other on accent. Celtic poetry is founded up-

on the agreement of sounds, hence arise rhyme, alliteration, and concord not always depending on the coincidence of final words, but also on some radical vowel in corresponding words, and these not terminal alone, but recurring in several places throughout the verse. Numerous illustrations were given of the various kinds of correspondence and concord, examples being taken from Gaelic, Irish, Armorican and Welsh poems, both ancient and modern, among the modern being Evan MacColl. The hope is expressed that some one with sufficient leisure will prepare a Celtic classical dictionary to do for Celtic scholars what Lempriere and Smith have done for Greek and Latin students, and that some Hermann or Bentley will soon appear with a full and lucid treatise on Celtic prosody, acting, until his task has been happily completed, on the advice of one of the acknowledged masters of Latin verse: "Nocturna versate manu, versate diurna."

TWENTY-THIRD MEETING.

Twenty-third meeting, 23rd April, 1892, the President in the chair.

Donations and Exchanges since last meeting, 61.

A. Gilchrist and T. A. Patrick, M.D., were elected members.

A communication was read from the Royal Society of Turin, announcing the conditions of the Bressa Prize.

The following resolution was passed, on motion by Mr. Bain, seconded by Mr. Hunter:—

"The Canadian Institute is called upon to mourn the loss of one of its honorary members, the late Abbé Provancher, who during his lifetime was an ardent and zealous naturalist, working in the fields of Botany and Zoology. He furthered, by his indefatigable labors as editor of *Le Naturaliste Canadien* during twenty years, the expansion of these branches of science, and gave to the world the results of his diligent and thorough research. The Institute places on record its appreciation of his services to science, and joins with the rest of the Dominion in mourning for the loss the scientific world has suffered in his death."

Mr. L. J. Clark read a paper on "Lake Currents." He explained the nature of the investigations carried on by the City Engineering Department last summer, for the purpose of ascertaining if sewage could be safely discharged into the lake, and, if so, the most favourable place. Operations were carried on from 35 to 40 days during the months of July, August, September, and October, under the supervision of Mr. C. Rust, Assistant Engineer. The Provincial Board of Health made an

analysis, both bacteriological and chemical, of a large number of samples of water, taken from the bay and from other points. The general tendency of the currents seemed to be controlled by the direction of the wind, although in some cases the undercurrent was found to be contrary to the wind and to the surface current. They mostly flow parallel to the coast line, that is north-east and south-west; and he is of the opinion that if the sewage were discharged well out into the lake, to the east of the intake pipe, there would be no danger of contaminating the water supply of the city. The intake pipe is considered to be in the best possible location, as it is the nearest point where deep water can be reached: and the main thing is to carry the sewage beyond the range of the mouth of the pipe.

Mr. Alan Macdougall read a paper on "The Indian as an Artist." He acknowledged the indefatigable labors of Mr. David Boyle in the cause of archæology and the generous liberality of the Provincial Government in aiding this branch of science by its annual grants. Referring to the Indians of this Province, he regretted the absence of any early writings from which one could learn anything of the technique of the Indians when the Jesuits laboured among them. Judging them by their pottery, there was reason to believe they must have had some alliance, ethnological or commercial, in early days with that interesting nation the Mound Builders. By numerous illustrations of their work, he pointed out the beauty of form in their flint arrow heads, the stone chipped celts, and other implements, all of which contain the special angles which form the graceful lines of the Gothic arch and other proportions which grace many architectural designs. Passing on to the Pacific coast, a rapid review was given of the work of the Queen Charlotte Island Indians, for whom he claimed an Egyptian origin, as the basis of their art. Filtered through many vicissitudes of wanderings and comminglings with other nations, the origin of their art was lost; but a hereditary instinct seemed to be left to them which gave them the skill requisite to produce the beautiful slate carvings which are undoubtedly entitled to rank as works of art. Assuming this to be the characteristic of the tribes, there seems to be sufficient authority to advance the theory that years ago, by trade if by no other means, the British Columbia Indians came under the influence of East Indian, and perhaps Japanese, art. Even in their grotesque carvings there are evidences of these influences. Referring to the famous totem poles, he illustrated through numerous photographs his belief that they were heraldic symbols, and expressed his belief that the Indians of this continent are the remains of a civilization which has been the foster mother of Greek and Roman and all other art.

TWENTY-FOURTH MEETING.

Twenty-fourth Meeting, 30th April, 1892, the President in the chair.

Donations and Exchanges since last meeting, 45.

Thomas McCraken and D. W. Beadle were elected members.

Nominations were made for officers and members of Council for the ensuing year.

The President read a translation from the Italian of the conditions of the Bressa Prize.

A paper by Mr. Richard Nettle on "The Artificial Propagation of Salmon and Trout in Canada," was presented by the Secretary. The first ovarium was constructed in Mr. Nettle's office in Quebec in 1857. He appears to have been very successful in his efforts. In 1862, an enthusiastic fly-fisher told him the River Moisie had increased its output in four years from 300 to 800 barrels. Reports from other rivers were equally favourable. He mentions an interesting case of gold fish leaping out of their division of an aquarium into that of the young salmon and devouring them; and another in which ova taken from a trout had vivified and hatched out in large numbers.

A. F. Chamberlain, M.A., Ph.D., read a paper on "Colour Comparisons in the Low German Poets." He discussed the use of colour comparisons by Meyer, Groth, Boysen, Babst, Bornemann, Weber, Ahrens, Ernst, Heyse, and other Plattdeutsch poets, paying special attention to those who wrote in the Ditmarsch dialect. By "colour comparisons" are meant such compounds and similes as correspond to the English:—Snow-white, pitch-dark, sky-blue, blood-red, bottle-green, green as grass red as a lobster, black as a crow, etc. Individual writers sometimes, prefer special forms, such as "rose-red," "white as chalk." The users of dialect often show their keener insight into nature by the comparisons which they employ. Thus we have "green as a beech tree in May," "eyes blue as the forget-me-nots," "yellow as the dandelion," "eyes black as currants," "white as a birch," etc. The presence of certain things favours the general use of some one form of comparison more than all others. Thus in some districts "white as a sea-mew," "white as chalk," "green as grass," may attain such general acceptance. He also referred to and discussed some curious figurative uses of the words for colour in the Plattdeutsch languages, such paradoxical forms as rot black ("red ink," literally, "red black"), groen black ("green ink") occur not infrequently. In one dialect witt lachen ("to laugh white") signifies to laugh in a kind or agreeable manner, and in another, gel snacken ("to

talk yellow") means to talk High German, which the Plattdeutsch peasant pleases to term "nonsense." In another part of the Low German linguistic territory an imperfectly known or uncertain colour is called blitzblau und dunnergrau ("lightning blue and thunder grey") though it may be neither blue nor gray.

Prof. A. B. Macallum, B.A., M.B., Ph.D., read a paper on "The Structure of Cell Protoplasm." It treated of the question of the structure of living protoplasm as known from studies on the dead cell, and from observations on the living elements. The various views were commented upon, and it was pointed out that all of these were the result of observations in limited fields of cystological research; that while, for example, the reticular structure is present in some cellular elements, the vesicular forms in others, and the fibrillar in others again, neither of these types of structure may be present in the living cell, and that, therefore, students must look to some other view which will cover, more fully than those at present at their disposal, all the phenomena of cell structure already observed and at the same time explain the relations of the nucleus to the cell and to life. A view was advanced that the cell protoplasm is an intermediary organ between the living element proper—the nucleus—and the outer world, and that the protoplasm is largely, if not wholly, derived from the nucleus elements, and therefore, as life advances, in accordance with Prof. Minot's view, the nuclear substance diminishes while the cell protoplasm is increased so much that the physical conditions imposed by so relatively large an intermediary organ bring the life of the element to an end. This view was applied to the elucidation of some of the phenomena connected with secretion, excretion, movement, etc. Its connection also with the present views as to what life is was also discussed.

FORTY-THIRD ANNUAL MEETING.

The Forty-Third Annual Meeting was held on 7th May, 1892, the President in the chair.

Donations since last meeting, 80, including 77 back numbers of The Canadian Journal, presented by the executors of S. B. Harman; Exchanges, 51.

A letter was read from the P. O. Dept., Ottawa, stating that the Postmaster General had received authority from the Executive Council to relieve the Institute of the expense of prepaying postage on their reports issued from time to time, and to either frank them or place the necessary stamps upon them. The Secretary was instructed to return thanks to the Post Master General.

The election of officers and members of Council for the ensuing year resulted as follows :—

President—Arthur Harvey, Esq.
Vice-President—Prof. A. B. Macallum, Ph.D.
Secretary—Alan Macdougall, M. Inst. C.E.
Treasurer—James Bain, Jr., Esq.
Librarian—D. R. Keys, M.A.
Curator—David Boyle, Esq.
Editor—George Kennedy, M.A., LL.D.
Members of Council—O. A. Howland, Esq.
L. J. Clark, Esq.
A. Blue, Esq.
James H. Pearce, Esq.
John Maughan, Ch. Biolog. Sec.
J. B. Williams, Sec'y Biolog. Sec.
J. C. Hamilton, LL.B., Ch. Hist. Sect.
B. E. Walker, Ch. Geol. and M. Sec.

The 43rd Annual Report was read and adopted.

The following resolutions were passed :—

That the thanks of the Institute be tendered to the Press for their courtesy in reporting so fully the meetings of the Institute.

That the Council be requested to consider the propriety of applying to the Dominion Government for a supplementary charter to add History, Literature and Art to the objects the Institute may study and promote, and to make clear the mode of election of the members of the Council.

FORTY-THIRD ANNUAL REPORT.

The Council of the Canadian Institute has the honor to lay before its members its Forty-third Annual Report.

It is once more an agreeable task to record the progress of the Institute. The meetings have all been well attended. An ample supply of papers, with a range as wide and varied as in any previous session, has created much interest and elicited spirited discussions at the ordinary meetings.

During the present session the regulations and by-laws have been remodelled and adopted at a special general meeting held for that purpose on the 9th of April. Considerable changes have been made; two new classes of members have been introduced—corresponding members

and associate. The former is an old class revived, on lines likely to promote interest in the Institute. The latter is a new class, which has very wide limits, created for the purpose of enlisting the co-operation of many who, not sufficiently advanced in science to be interested in all the work of the Institute, are earnest workers in such subjects as history, archæology, geology, botany, political and economic science.

The small fee of $2 per annum will enable many to join, and take advantage of the liberal privileges extended to this class.

The rules of the library and reading room have also been amended. The new rules came into force on the 1st of February and have since that date been carried out to the advantage of the members.

The interest in the work of the sections increases.

The Biological or Natural History Section has held 15 meetings, at which 15 papers were read. The field days have been as successful as formerly, and the work of the sub-sections has been vigorously carried on.

The Historical Section has increased its membership from 27 to 45. Six meetings were held during the session ; all were well attended ; six papers were read. The Section makes special note of the increasing interest in historical matters, both in the Institute and by the general public, and expresses satisfaction at the steps taken by the government towards the establishment of a national park.

The Mining and Geological Section held three meetings at which a like number of papers were read. The membership has not increased, though they look for an increase in the immediate future.

Early in the summer of last year, a movement was inaugurated to consider the most advantageous scheme for enlarging the scope of the Institute, and the advisability of removing to a more central and readily accessible situation. Two plans were presented : one embraced the enlargement of the present building by adding a museum on the vacant portion of our lot, and remodelling the present reading room and library ; the other contemplated the removal of the Institute from the present site to one in a more northern or up-town district. After several meetings had been held, at which the projects were fully discussed, the members at a special General Meeting called for the purpose on the 19th June, 1891, vetoed all the proposals laid before them.

The adoption of cosmic time, in relation to the use of the 24-hour notation, has been greatly advanced by the labors of a special committee of the American Society of Civil Engineers, the chairman of which was our distinguished honorary member, Sandford Fleming, LL.D., C.M.G.

The Committee recommended in their final report which was presented on the 20th January, 1892, the adoption of the new notation of time on all railways in America "on the 12th October, 1892; that date being suggested in compliment to the fatherland of Columbus." The report states that "From the latest information received, it is evident that Europe is now making the first great step in time reform which America made in 1883, in introducing Standard Time into general use. In the second important step, the adoption of the 24-hour notation, this country is somewhat anticipated by India, and we need not be greatly astonished to hear of a rapid development of the reform in Europe, when once the first step is fully taken."

The Council noted with much pleasure the formation of a Royal Commission to enquire into the protection of fish and game.

A Royal Commission has been issued to enquire into and report upon the preservation of the forests and the formation of a National Park.

A paper of very great interest to the fruit-growing industry was presented by Dr. W. R. Shaw, the subject being the disease known as "Peach Yellows." This paper created a deep interest in the great peach-growing district, the Niagara peninsula. Resolutions were passed by the Lincoln Farmers' Institute, and the Fruit Growers' Association, the Council of the Township of Niagara, and other bodies, requesting the Institute to bring the subject under the notice of the Local Legislature during its last session. An influential deputation from the bodies named, accompanied by a Committee from the Institute, waited on the Government, by whom they were courteously received. Owing to the late period of the session it was not practicable to introduce the legislation asked for; there is no doubt, however, that at the next session important legislation will be obtained intended to prevent the spread of peach yellows, black knot, and other dreaded diseases among our orchards, and that this valuable and extensive industry will have proper protection accorded to it.

A paper on Electoral Representation and the Rectification of Parliament, by Dr. Sandford Fleming, has created great interest. A friend of the Institute, who has declined to make known his name, has generously placed at the disposal of the Council the sum of $1,000, to be awarded in whole or in part, for the best measure which if made law would give to the whole Canadian people equal representation in Parliament and each elector due weight in the Government through Parliament. The conditions of the competition have received the most careful attention of the Council, and will be made public in a few days.

The invitation to hold a summer convention in the town of Penetanguishene led to a very pleasant and interesting visit to soil rendered historical by the establishment there at a very early epoch of a fort for the protection of the Jesuit Fathers and the French interests at large. The convention was held on the 25th and 26th September, the meetings were well attended, and the papers read by the resident historians were of much interest. An Excursion was made to Christian Island on the 26th. A meeting was held in the Council chamber of the Indian village of St. Joseph, at which Chief Samuel Assance, Thomas Skye, a veteran of 97 years of age, and John Monague spoke. The latter, an old man of 80, gave an interesting account of how he and others were taken to Toronto, in 1837, and sent to look out and intercept Mr. W. Lyon Mackenzie. He added naively that as he and his party did not know Mr. Mackenzie, they did not see how they could intercept him. Fort Ste. Marie was thoroughly explored. Another excursion was made to Fort Ste. Marie, on the River Wye, near the town of Midland, on the 28th ; the ruins examined, the site traced out, the water gate readily recognized and the channel of the canal, which had been used by the Jesuits for approaching the fort, identified. A proposal to secure this extremely interesting historical site for future preservation as a public memorial has received encouragement, and an advantageous offer for the purchase of the land on which the fort stands has been made to the Institute.

The Council takes pleasure in again acknowledging the generosity of the Government in continuing the Archæological grant.

The Archæological Report of the curator published in advance of this, again deals with a wide field of interest. In the chapter on craniometry, 48 skulls are figured and described ; the Institute is indebted to Drs. S. K. Boyle and L. K. Meade for their kind labors in this matter. The demand for this report has been so great that the edition is already exhausted.

Additions by purchase and presentation have been made to the museum of specimens from all parts of the Dominion, the greater number being naturally from friends in our own province. A full list of the names of donors to the museum is published in the report.

An agreement was entered into with the Public Library Board for the transfer of the custody of our Archæological collection to that Board, to be placed in their proposed museum. The arrangement has unfortunately been interfered with by adverse action of the City Council, but there is still a prospect of arrangements being arrived at which will carry out in part this plan, thereby relieving the overcrowding of the

museum and library and placing considerable space at the disposal of the sections for the extension of their special work.

The approaching centennial celebration of the formation of the Province of Upper Canada, and the institution of parliamentary government which gave us self-governing powers, is to be celebrated with fitting ceremonies at Niagara on the 16th July, and in Toronto on the 17th September. The Council impresses on the members the value of the occasion to urge on the government and the public generally, the great importance of preserving historical documents deserving the attention of the administrations of all the provinces in the Dominion, as well as the preservation of historical spots, such as the numerous forts scattered over the provinces, which have played important parts in our early history.

The accommodation in the reading room is inadequate, and the comfort of the members in consequence much impaired; it is intended to relieve this as soon as the museum can be moved to the public library building.

The Treasurer's accounts have been audited and found correct. They will be found in Appendix II.

The state of the membership will be found in Appendix I.

When the new rules and regulations come into force on the 1st of July of this year, the present associates will be termed juniors.

An entirely new class has been formed who will be known as associates.

During the past year the Institute has lost by death one honorary member, the Abbé Provancher; two life members, Dr. T. Sterry Hunt, and Mr. John Page, and one ordinary member, Mr. Chas. Levey.

The thanks of the Institute are due and are tendered to the Press for full reports of our meetings.

The reports of the Sections are given in full in the appendices.

The Council again acknowledges with pleasure the services rendered to the Institute by the Assistant Secretary, Mr. R. W. Young, M.A.

All of which is respectfully submitted.

ARTHUR HARVEY,
President.

ALAN MACDOUGALL,
Secretary.

TORONTO, 29th April, 1892.

APPENDIX I.

MEMBERSHIP.

Honorary Members		6
Life Members		9
Ordinary Members, May 1, 1891	273	
Deaths	1	
Resignations	12	
Suspense	1	
Names erased	16	
	30	
	243	
Members elected, 1891-92	40	
		283
Total membership, 1 May, 1892		298
Associates as at May 1, 1891	17	
Resignations	2	
Names erased	1	
Transferred to members	2	
	5	
Total, May 1, 1892	12	

APPENDIX II.

FINANCIAL STATEMENT.

James Bain, Jr., Treasurer, in account with the Canadian Institute for the year ending March 31st, 1892.

DR.

To Balance in Imperial Bank	$ 668 39
" Cash in hand	42 34
" Annual Subscriptions	718 31
" Rent	19 25
" Government Grant	1,000 00
" Periodicals sold	46 15
" Extra Copies of Transactions	3 27
" Interest on Deposits	24 58
" Dr. Fleming's Annual Donation	200 00
" Amount refunded by Univ. Library for binding	9 32
	$2,731 61

CR.

By Salaries	$384 00
" Printing (Transactions)	386 84
" " (Miscellaneous)	58 62
" Engraving	148 89
" Stationery	35 10
" Postage	165 35
" Freight and Express Charges	14 74
" Repairs	67 43
" Gas	34 90
" Water	6 25
" Periodicals	154 30
" Furniture	102 20
" House Cleaning	71 50
" Fuel	118 00
" Museum Expenses	5 68
" Duty	43 00
" Type Writing	5 00
" Surveyor's Report	5 00
" Legal Expenses	6 00
" City Directory	5 00
" Petty Charges	3 60
" Interest	200 00
" Balance in Bank to Building Fund	700 00
" " " Ordinary Account	80
" Cash in Hand	9 41
	$2,731 61

Examined and found correct.

(Signed) JOHN G. RIDOUT, L. J. CLARK, } *Auditors.*

April 25th, 1892.

ASSETS AND LIABILITIES.

ASSETS.

Building and Grounds	$18,000 00
Library	5,000 00
Specimens	6,000 00
Personal Property	1,000 00
Building Fund, Cash in Bank	700 00
	$30,700 00

LIABILITIES.

Mortgage due 1896	$ 4,000 00
Balance in favour of the Institute	26,700 00
	$30,700 00

Audited as an approximate estimate.

(Signed) JOHN G. RIDOUT, L. J. CLARK, } *Auditors.*

April 25th, 1892.

ARCHÆOLOGICAL FUND.

James Bain, Jr., in account with the Archæological grant to the Canadian Institute, 1891-92.

1891.		
May 1.	To Balance in hand	$ 180 05
June 22.	" Annual Grant	1,000 00
	Balance due Treasurer	7 63
		$1,187 68

1891.		
By	Travelling Expenses and Postage	$ 188 45
"	Purchase of Specimens	518 85
"	Curator's Salary	400 00
"	Cases	80 00
"	Bank Draft	38
		$1,187 68

Audited and found correct as per vouchers.

(Signed) JOHN G. RIDOUT. L. J. CLARK. } *Auditors.*

April 25th, 1892.

We the undersigned Auditors beg leave to report that we have checked the cash account with the vouchers, and have examined the bank book and find the various items and balances correct; and have also examined and compared with vouchers the various items relating to the Archæological grant, and find the same, as well as the balance due the Treasurer, correct.

Respectfully submitted.

(Signed) JOHN G. RIDOUT, L. J. CLARK, } *Auditors.*

Toronto, April 25th, 1892.

APPENDIX III.

PAPERS READ DURING THE SESSION 1891-92.

1891. Nov. 7. "A Critical Review of the Enterprise of Christopher Columbus,"—Inaugural Address by the President, A. Harvey.

" " 14. "The Formation of Niagara River,"—W. J. Smith.

" " 21. "Déné Roots,"—Rev. A. G. Morice, O.M.I.

" " "Peach Yellows,"—W. R. Shaw, M.D.

" " 28. "St. Columba, or Colum Cille,"—Rev. Neil MacNish, LL.D.

" Dec. 5. "The Spirit of National Art,"—W. A. Sherwood

" " 12. "The Finances of the American Civil War,"—W. A. Douglass, B.A.

" " 19. "Testing the New Water-pipe,"—Levi J. Clark.

1892. Jan. 9. "The Aborigines, or Bœothicks of Baccalaos,"—Rev. Philip Tocque, A.M.

" " 16. "Economic Science for Canadian Students,"—W. Houston, M.A.

" " 23. "The Abenakis of the Saint John River,"—Edward Jack, Fredericton, N.B.

" " 30. "The Volcano of Kilauea and the Hawaiian Islands,"—H. Spencer Howell, Galt, Ont.

" Feb. 6. "The Great Centre: An Astronomical Study,"—J. C. Hamilton, LL.B.

" " 13. "Siberian Inscriptions,"—Rev. Prof. Campbell, LL.D.

" " 20. "Electoral Representation, and the Rectification of Parliament,"—Sandford Fleming, LL.D., C.M.G.

" " 27. "Early Traders and Trade Routes in Ontario and the West,"—Captain Ernest Cruikshank.

" Mar. 5. "History of Greenland and Iceland,"—W. D. Stark.
"Rutherford's Narrative: An Episode in the Pontiac War, 1763: An unpublished MS., with introductory notes,"—Arthur Harvey.

" " 12. "Lieut.-Col. Coffin and his Private Correspondence during the Rebellion of 1837,"—H. R. Fairclough, M.A.

" " 19. "Gleanings from European Art Fields; II. Paper: (Nineteenth Century Sacred Art),"—J. W. L. Forster.
"The Southwold Earthwork, and the Country of the Neutrals,"—James H. Coyne, B.A.

1892. Mar. 26. "The Ontario Game Laws,"—G. S. Wilgress, B.A., Barrister, Huntsville.

" April 2. "The Phocas of Terre-Neuve,"—Rev. Philip Tocque, A.M.

"An Animated Molecule and its Nearest Relatives,"—Daniel Clark, M.D.

" " 9. "Canadian Wild Flowers,"—Delos W. Beadle.

" " 16. "Celtic Prosody,"—Rev. Neil MacNish, LL.D.

" " 23. "Lake Currents,"—Levi J. Clark.

"The Indian as an Artist,"—Alan Macdougall, M. Inst., C.E.

" " 30. "Colour Comparisons in the Low German Poets,"—A. F. Chamberlain, Ph. D.

"The Structure of Cell Protoplasm,"—Prof. A. B. Macallum, Ph. D.

"On the Artificial Propagation of Salmon and Trout in Canada,"—Richard Nettle.

Total number of papers read at the ordinary meetings of the Institute during the session 1891-92, 31, which may be classified as follows:—

Archæology	1	History	5
Astronomy	1	Literature	1
Biology	3	Philology	4
Botany	1	Pisciculture	1
Economics	2	Political Science	1
Engineering	2	Zoology	1
Ethnology	3	Miscellaneous	1
Fine Arts	2		
Geography	1	Total	31
Geology	1		

READ AT MEETINGS OF SECTIONS.

Biological Section	15
Geological and Mining Section	3
Historical Section	6
Total	24
Total read during the Session	55

REPORT OF THE LIBRARIAN.

TORONTO, May 6th, 1892.

To the Council and Members of the Canadian Institute :—

GENTLEMEN,—In presenting his annual report your librarian has first to record the establishment of a new set of rules intended to facilitate and increase the use of books and periodicals by making it possible for a larger number of members to avail themselves of the privileges of the library and the reading room. The experience of the few weeks during which the rules have been in operation gives evidence that they have had the effect intended, and have been appreciated by the members whose earnest co-operation in carrying them out will add greatly to the educative value of this important branch of the work of the Institute.

The cataloguing of the library has been deferred owing to the state of the treasury, which has rendered it impossible to obtain even the smallest appropriation for such a purpose. Your librarian would urge upon the Council and members the importance of a catalogue and the insecurity that results from the lack of one in the present state of the library.

The plan for a bibliographical catalogue of the contents of the Institute's periodicals and exchanges has made better progress. This scheme requires men rather than money, and it is a pleasing proof of the scientific ardor of the members of the Institute that a number of gentlemen have undertaken this laborious but not uncongenial task. In connection therewith the President has suggested the preparation of a bibliography of the Transactions of the Institute to which he himself has already made an important contribution, and which it is proposed to complete in the course of the coming session.

In conclusion your librarian begs to report the library statistics as follows :—

LIBRARY STATISTICS—1891-92.

Periodicals subscribed for	34
Separate numbers received from April 1, 1891, to April 1st, 1892	835
Number of books and periodicals taken out	2,013
Number of societies, individuals and periodicals to which the publications of the Institute are sent	525

DONATIONS AND EXCHANGES.

(From April, 1891, to, April 1892.)

Donations	176
Exchanges received from—	
Canada	247
United States	911
Mexico, West Indies and South America	59
Great Britain and Ireland	484
Austria-Hungary	157
Belgium	18
Denmark	5
France	441
Germany	421
Italy	235
Netherlands	30
Norway	35
Portugal	13
Roumania	3
Russia	54
Spain	15
Sweden	14
Switzerland	12
Turkey	19
Asia	75
Australasia	19
Total Exchanges	3,267
Donations	176
Purchases	835
Total received during the year	4,278

All of which is respectfully submitted,

(Signed) D. R KEYS,
Librarian.

REPORT OF THE BIOLOGICAL SECTION OF THE CANADIAN INSTITUTE, 1891-92.

TORONTO, April 20th, 1892.

It is with pleasure that on my retirement from the office of Secretary of this Section, I am able to report a successful session.

Fifteen meetings have been held, at which fifteen papers were read. A schedule of them is attached.

Field days have been very successful, many plants having been added to our museum through the energy of the members and their friends. The outings were held at Mount Dennis, Scarboro Junction, and Victoria Park respectively, with good attendance.

Most of the work of the Section has been concentrated in its Sub-sections.

The Ornithological Sub-section has again handed in a vast amount of very valuable material for publication. The work of this Sub-section is advancing, and the results are increasing under the able chairmanship of Mr. Wm. Brodie.

The Microscopical Sub-section has been progressing. The work done is not confined to any particular branch of Microscopical Science, but embraces both Organic and Inorganic Science, and which is being thoroughly investigated under the leadership of Mr. G. G. Pursey, at meetings held fortnightly throughout the year.

The Botanical Sub-section, under the chairmanship of Mr. Samuel Hollingworth, was organized on April 11th, 1890, and has held 35 meetings, at which 557 species of plants were identified, of which 389 bear date up to the end of 1890, including specimens from the collection of the late Dr. Cowdry, collected in and after 1866, also a collection by Mr. Samuel Hollingworth, 1885, and a collection of ferns by J. L. Little, 1888. Four hundred and seventy-four species were identified in 1891, of which 171 were new records over the previous year. Of the above total 499 species were found in the vicinity of Toronto.

This Sub-section has again to acknowledge great assistance from Miss Alice Hollingworth, of Beatrice, Muskoka, in collecting specimens and information of the 'flora' of that district, also to Mr. Geo. P. Payne, of Toronto, to whose energy in collecting we owe many of the specimens in our Herbarium.

Several additions have been made to the museum, and our Curator, Mr. Jas. Noble, is now busy arranging the different departments, with a help of a museum committee. The Botanical cabinet is finished and most of the specimens are transferred to it, but not yet properly arranged and catalogued.

Your President of the Natural History Society, and Chairman of the Biological section of the Canadian Institute desires to thank you for his position for four years, to express his regrets that ill-health precludes him from attending night meetings at the season which demands his

presence, and to say that all he can do in the future will be willingly accorded, with the knowledge that the study of nature brings us closer to nature's God.

JAMES H. PEARCE, *President.* CHAS. W. ARMSTRONG, *Secretary.*

PAPERS READ DURING SESSION 1891-92.

Jas. H. Pearce ..... *President's Address.*
C. W. Armstrong ..... *Eucalyptus Globulus.*
Arthur Harvey ..... *Latest Developments of Glacial Action around Toronto.*
Jas. Noble ..... *Trilliums.*
J. Thurston ..... *Report of Ornith. Sub-section.*
J. B. Williams ..... *Migration of Evening Grosbeak.*
C. W. Armstrong ..... *Botanical Sub-section: Its Work and Progress.*
Jas. H. Fleming ..... *Birds Seen in the Market at Nice.*
J. Maughan, Jr ..... *Taxidermy as an Art. Part I.*
W. D. Stark ..... *Solan Goose.*
J. B. Williams ..... *Notes on an European Tour.*
Jas. Noble ..... *Vernation.*
J. B. Williams ..... *Canadian Walking Stick Insect.*
Alice Hollingworth ..... *Scientific Researches in Rural Districts.*
Jno. Maughan, Jr ..... *Taxidermy as an Art. Part II.*
" " " ..... " " " *Part III.*

REPORT OF THE GEOLOGICAL AND MINING SECTION.

TORONTO, April 29th, 1892.

Hon. Secretary of the Council of the Canadian Institute:—

DEAR SIR,—I beg to report on the Geological and Mining Section for the season 1891-92.

There have been three papers read before the Section during the present year, viz., one by Mr. Hamilton Merritt, F.G.S., on the "Silver Ores of West Kootenaie, B.C." Mr. Merritt shewed numerous samples collected during his visit to that Province, and gave an interesting account of the Geological features of that important region.

Mr. J. B. Hammond, of Sudbury, read a paper on "The Nickel Deposits of Algoma," which was followed by an interesting discussion.

Mr. George Mickle, M.E., read a paper on the "The new Nickel Compound, Nickel Carbon Oxide," and exhibited specimens of Nickel which he deposited on glass tubing from this gaseous compound.

The Section regret to report that their membership has not increased during the present year, but several have promised to join next year, and their presence will, no doubt, impart new life to the Section.

The following officers were elected for the coming year :—*Chairman*, Mr. B. E. Walker ; *Vice-Chairman*, Prof. Coleman ; *Secretary*, George Mickle, M.E.; *Committee*, Messrs. Archibald Blue, D. Boyle, Arthur Harvey, T. R. Clougher, W. H. Merritt, F.G.S ; *Curator*, Mr. R. Dewar.

I remain, yours,

GEORGE MICKLE,
Secretary Geological and Mining Section.

REPORT OF THE HISTORICAL SECTION.

TORONTO, April 21, 1892.

To the Council of the Canadian Institute :—

The Historical Section begs to report, at the end of its second year's existence, that the number of members on its roll has increased from 27 to 45. The attendance at the meetings has been large and the discussions following the reading of papers full of interest. The Section notes with much pleasure the increased attention given to historical subjects by the Institute at large, also by the general public, and believes it has in some measure contributed thereto. Under the new and liberal rules of the Institute, which permit gentlemen and ladies who are interested in the particular work of any one section to become associates of the Institute for a merely nominal fee and to take part in all the proceedings of that Section, it is probable that a further impetus may be given to the study of History, which has hitherto been in Canada too much neglected.

The following proceedings are recorded in the minutes of the Section :—

Oct. 16th, 1891.—Business meeting, recommending the purchase by public subscription of the site of the old Fort Ste. Marie, on the Wye. Correspondence between our local agent and the owner is in progress, which will, it is hoped, result satisfactorily in securing this interesting spot for the Institute.

Nov. 19th, 1891.—Paper by W. Canniff, M.D., M.C.S., on "Pioneer Medical men of Upper Canada." The paper gave many interesting

details of the modes of licence, examination and practice in the early days of this province.

Dec. 17th, 1891.—Mr. D. Boyle presented a paper on "The Discovery of the Great Falls of Labrador." This was opportune, as the newspapers of New York were claiming for a Bowdoin College expedition, the discovery of these falls, and the right of naming them. The discovery was made in 1839, by the late John McLean of the Hudson's Bay Company's service. The paper was recommended for publication in the "Transactions" and the Section is pleased to see it has been published in the number just issued. A very interesting paper was read at the same meeting by Mr. J. G. Ridout, "Gibraltar, with Illustrations." At this meeting, too, a resolution was passed and forwarded to the Council to call attention to the importance, as formerly urged by the Institute, of setting apart several townships on the head waters of some of our northern rivers as a national park. The Section is pleased to note that a Royal Commission has been appointed by the Lieut.-Governor in Council to fully consider this subject, for, in addition to its value to natural history, forestry, pisciculture and the preservation of many animals and birds from possible extinction, the establishment of natural parks will conduce to the fostering of a patriotic spirit and be a means of increasing interest in Canada abroad.

Feb. 21st, 1892.—At this largely attended meeting Mr. Arthur Harvey read a treatise on "The Labarum of Constantine the Great, and the new views thereon of Mr. Christopher Samarsidis, Gymnasiarch (Principal of the Collegiate Institute), of Adrianople, Turkey." Mr. Samarsidis had traced in the arcs and crosses of a parhelion, as in a monogram, the very letters of the celebrated *ΤΟΥΤΩ ΝΙΚΑ*, and the emblems *XP*. The paper dealt with this subject and was illustrated by diagrams of parhelia (frequent in Canada) and other atmospheric phenomena which may have had some connection with the vision of Constantine. The feeling formerly, and even yet, excited by such displays was alluded to, with quotations, also the circumstances which led to the decay and fall of Polytheism, and the adoption of Christianity as the religion of the Roman Empire. One of the objects of the paper was to show "how rapidly a ripple on the shores of the blue Ægean now reaches our Canadian lakes."

March 24th, 1892.—A paper by Mr. Jas. Bain, Jr., on "The Rebellion of 1837-8, as seen by an English officer," gave an account by Lieut. Hutton, 34th Regt., of his travels with the troops and the part they took in repelling the American sympathisers of that day. The action at Sandwich in which Col. Prince commanded the Canadian militia was described in apparently impartial terms. The paper elicited a warm

discussion, and it became evident that the time has hardly arrived yet for a dispassionate survey of the events of that period. It was stated by Mr. Bain that diaries and letters relating to these times exist in greater quantity than usually supposed, and it is to be hoped that their possessors will place them at the disposal of this section for copying, if not for the preservation of the originals.

April 21st, 1892.—The last paper of the Session was read by Mr. J. C. Hamilton, LL.B., "Afro-Canadian—Retrospect and Prospect," being the conclusion of his exhaustive work on the colored race in Canada, of which several prior chapters have been communicated to the Institute or to the Section. We hope soon to see the completed volume in print, and trust it will be as acceptable to the general public as it has been interesting to the members

The officers of the Section, elected for the ensuing year, are:—*Chairman*, J. C. Hamilton, M.A., LL.B.; *Secretary*, O. A. Howland; *Council*, J. G. Ridout, Robt. Jenkins, Geo. M. Rae.

ARTHUR HARVEY,

Secretary.

PROCEEDINGS OF THE ORNITHOLOGICAL SUB-SECTION OF THE BIOLOGICAL SECTION OF THE CANADIAN INSTITUTE.

EDITED BY THE EDITING COMMITTEE.

(Twenty-sixth meeting, April 15, 1890).

Arrivals.—*Totanus melanoleucus*, Greater Yellow-legs April 4, on the sand-bar, Ashbridge's bay. *Sayornis phoebe*, April 14, Phoebe on Don Flats. *Zonotrichia albicollis*, April 14, White-throated Sparrow in city. *Turdus aonalaschkæ pallasii*, Hermit Thrush, collected April 14, in the city.—JOHN EDMONDS.

Arrivals at Sharon, Ont.—*Melospiza fasciata*, Song Sparrow first seen April 3, numerous on April 5, *Sialia sialis*, Bluebirds first seen flying high overhead on April 3; April 4, they began to settle down and on April 5, were quite common about every fence and stump. *Sturnella magna*, First Meadow Larks seen on April 3, common on April 5. *Sayornis phœbe*, Phœbe, observed on April 5, quite common on April 7. *Passerella iliaca*, Toronto.—On April 13, I observed a small flock of Fox Sparrows in the Queen's Park. *Sphyrapicus varius.* On April 13, I watched a female Yellow-bellied Sapsucker in the Queen's Park, sucking sap from holes she had pierced in the bark of a maple tree. Having sucked the sap from the holes already made she began pecking another hole and by the time it was finished the old ones were filled again, and she would return and empty them. A slight disturbance would cause her to fly away a short distance but she soon returned to enjoy her favorite drink. Examining the ground at the root of the tree I found pieces of bark, cut from the holes, scattered around.—C. E. PEARSON.

Otocoris alpestris praticola.—On April 4, I collected a pair of Shore Larks on the Island. The female had been sitting on eggs.—J. A. VARLEY.

Tachycineta bicolor.—On April 4, I observed the first Tree Swallows on the Island and on April 5, I saw about a dozen at Balmy Beach.

Spizella monticola, Tree Sparrows, were first observed on April 4, and Savannah Sparrows, *Ammodramus sandwichensis savanna*, were seen on April 12, at the Woodbine Race Course.—J. B. WILLIAMS.

Arrivals —April 7, Piping Plover, *Ægialitis meloda*. April 4, White-rumped Shrike, *Lanius ludovicianus excubitorides*. April 7, Blue Heron, *Ardea herodias*.—W. CROSS.

Arrivals.—At Ayr, Ont., 1890, Feburary 2, *Acanthis linaria*, Redpoll *Cyanocitta cristata*, Blue Jays have been seen here regularly since March 1. March 15, *Merula migratoria*, Robin. March 16, *Melospiza fasciata*, Song Sparrow. *Molothrus ater*, Cow-bird. March 24, *Sturnella magna*, Meadow Lark. *Sialia sialis*, Blue-bird, May 7, *Icterus galbula*, Baltimore Oriole.—W. PARKS, AYR.

(Twenty-seventh meeting, April 29, 1890.)

Arrivals. — March 25, Blue-birds, *Sialia sialis*, Robins, *Merula migratoria*, Field Sparrows, *Spizella pusilla*, were seen at Georgetown. March 31, *Otocoris alpestris praticola*, Shore Larks, *Falco sparverius*, common at Georgetown; a scattering of snow on ground. March 31, *Merula migratoria*, *Sialia sialis*, *Melospiza fasciata*, first seen at Lamaroux, Scarboro Township. The ground was covered with snow, and deep drifts in many places. April 2, *Merula migratoria*, *Spizella fasciata*, common at Toronto. April 5, Bronzed Grackles *Quiscalus quiscula æneus*, were first seen at Toronto.—WM. BRODIE.

March 26.—To-day I saw the first Bronzed Grackles *Quiscalus quiscula æneus*, on Bathurst St. March 30, I saw a flock of geese, flying high in the air, towards the North. April 4, Observed first Phœbe, *Sayornis phœbe*, Golden-crowned Kinglet, *Regulus satrapa*, and Tree Swallow, *Tachycineta bicolor*. April 4, Saw first Ruby-crowned Kinglet, *Regulus calendula*, Brown Creeper, *Certhia familiaris americana*, Field Sparrow, *Spizella pusilla*, Tree Sparrow, *Spizella monticola*, Cowbird, *Molothrus ater*, Hairy Woodpecker, *Dryobates villosus*, Bank Swallow, *Clivicola riparia*, and secured one Meadow Lark, *Sturnella magna*. April 5, secured the first Vesper Sparrow, *Poocætes gramineus*, Chipping Sparrow, *Spizella socialis*, Savannah Sparrow, *Ammodramus sandwichensis savanna*. April 6 and 7, no Tree Swallows, *Tachycineta bicolor*, were to be seen around the city, weather being colder. April 8, Tree Swallows returned. April 8, saw first Purple Martin, *Progne subis*, Barn Swallow, *Chelidon erythrogaster*, and Yellow-bellied Sapsucker,

Sphyrapicus varius. April 11, I counted twenty three Flickers, *Colaptes auratus*, on the University Lawn. April 12, saw first Baltimore Oriole, *Icterus galbula.* April 13, *Zonotrichia leucophrys*, White-crowned Sparrow, *Zonotrichia albicollis*, White-throated Sparrow, *Pipilo erythrophthalmus*, Towhee, *Turdus aonalaschkæ pallasii*, Hermit Thrush, *Turdus swainsonii*, Olive-backed Thrush, *Turdus fuscescens*, Wilson's Thrush. *Passerella iliaca in flocks.*—To-day, April 13, I saw a flock of about forty of the above birds in the University Ravine; but they were so shy I could only secure one specimen. This is the first record, of a flock of Fox Sparrows, in Toronto, and the first record of any being taken in the spring. They were feeding on the ground, and could be seen scratching among the leaves on the side of the ravine, and on being disturbed, they flew up among the bushes, and were off before a shot could be secured. I also saw another flock on Well's Hill, and secured two specimens on April 14. They were surrounded by a guard of Juncos, *Junco hyemalis*, and were very hard to approach, as the Juncos flying up startled them, and they were off immediately. April 15, Saw two specimens of *Carpodacus purpureus*, Purple Finches, and two *Loxia leucoptera*, White-winged Crossbills, in the University Grounds; also saw first *Dendroica coronata*, Myrtle Warbler, and first *Troglodytes ædon*, House Wren.—G. E. ATKINSON.

Acanthis linaria rostrata, at Toronto.—Among a number of Redpolls sent to Washington for determination by Mr. Ridgeway, is a young male, taken at Toronto by Mr. Cross, on February 10, 1890, and an adult female taken at Lorne Park, November 9, 1889, which were pronounced the Greater Redpoll.

Acanthis linaria holbœllii, at Lorne Park.—Three specimens, one male taken March 3, and a male and female March 15, 1888. were determined Holbœll's Redpoll, but they are not typical of the form but nearer to that than to *linaria.*

Otocoris alpestris praticola, notes from Ottawa.—On the level plain that extends three miles north of this city, I saw, on March 23, seven solitary Shore Larks, and one pair, and on the open plain of Quinnville I saw another pair; although the weather is cold, and the snow is still deep; they seem to be mated and settled for the season, On the experimental farm I secured a male, on March 25, and was told by Mr. Fletcher, that several pairs breed each year, on the high dry knolls of the farm, and raise two broods each season.—ERNEST E. THOMPSON.

Arrivals.—On Sept 23, T. Harmer, secured the first Spotted Sandpiper, *Actitis macularia*, also Tree Swallow, *Tachycineta bicolor*, Cliff

Swallow, *Petrochelidon lunifrons*, and Bank Swallow, *Clivicola riparia*. April 24,—Swamp Sparrow, *Melospiza georgiana*, Sora Rail, *Porzana carolina*. April 27.—Black and White Warbler, *Mniotilta varia*, Black-throated Green Warbler, *Dendroica virens*. April 28, This morning I secured a fine Meadow Lark, *Sturnella magna*, in a thick hardwood bush in Rosedale.—JAMES R. THURSTON.

Port Sydney Observations for 1888, and 1889.—The following rare birds have been observed by me at the above place in 1888, April 7, Three-toed Woodpecker, *Picoides arcticus*, Fox Sparrow, *Passerella iliaca*, on May 1, I shot a fine specimen of the latter species. May 3, secured a pair of Pileated Woodpeckers, *Ceophlœus pileatus*, May 16, Traill's Flycatcher, *Empidonax pusillus traillii*, this species seems to be abundant, as I have since observed a large number, several of which I secured. May 19, Virginia Rail, *Rallus virginianus*, Solitary Sandpiper, *Totanus solitarius*. June 14, Olive-sided Flycatcher, *Contopus borealis*.

March 15, 1889.—Pair of Canada Jays, *Perisoreus canadensis*. March 19, Pine Siskin, *Spinus pinus*, March 22, another pair of *Perisoreus canadensis*.

Gravenhurst Observations 1889.—May 25, Catbird, *Galeoscoptes carolinensis*, May 28, House Wren, *Troglodytes aedon*, caught on nest which contained six eggs. September 9, Sora Rail, *Porzana carolina*, found dead on R. R. track; Least Bittern, *Botaurus exilis*.

1890.—Jan 4, Robin, *Merula migratoria;* January 17, Male Evening Grosbeak, *Coccothraustes vespertina;* January 19, two Pine Grosbeaks, *Pinicola enucleator;* January 8, full plumaged Goshawk, *Accipiter atricapillus*, January 29, Robin; March 11, to 28, secured specimens of Shore Lark, *Otocoris alpestris;* March 12, two Pine Grosbeaks, *Pinicola enucleator;* March 28, three male Snow Buntings, *Plectrophenax nivalis*. —WM. MELVILLE.

Corvus americana nesting.—On April 16, I found a Crow's nest in the University Grounds. It contained five fresh eggs. This nest was in the top of a pine tree; on the same day I got another containing four eggs, out of a beech tree at Greenwood's Crossing.

Migrants.—White-throated Sparrows, *Zonotrichia albicollis;* Hermit Thrushes, *Turdus aonalaschkæ pallasii* and other northern birds have been very numerous around the Queen's Park since April 22, migration is evidently in full swing.—CHAS E. PEARSON.

Passerella iliaca.—On April 18, at the University Grounds I saw several of the above rare Sparrows, I also saw several more travelling with Juncos on Well's Hill on the same day and also from April 20 to April 23.

Merula migratoria, nesting, On April 22 I found two nests of the robin nearly completed.—HUBERT H. BROWN.

Ægialitis vocifera arrived.—On April 20, I saw first of the above plover at Leslie's Nurseries, East Toronto. On same day I saw a Fox Sparrow (*Passerella iliaca*), in Rosedale.—JOHN. EDMONDS.

The following list of birds are mentioned as occurring at Listowel, County Perth, by W. L. KELLS.

Podilymbus podiceps.—Mentioned as taken occasionally on the river.

Aix sponsa.—A Pair of Wood Ducks nested near there for several successive years, some of the young were captured.

Botaurus lentiginosus.—Casual visitor.

Botaurus exilis.—Casual visitor supposed to breed.

Ardea herodias.—A common visitor to the creeks and ponds in the neighbourhood.

Ardea virescens.—One specimen of the Green Heron captured in 1889.

Nycticorax nycticorax nævius.—One specimen taken from a flock of five in 1887.

Rallus virginianus.—Occasionally breeds.

Porzana carolina.—A summer resident, several nests taken.

Philohela minor.—A rare summer resident.

Gallinago delicata.—A fall migrant.

Tringa minutilla.—Generally seen as a fall migrant.

Totanus melanoleucus.—A few seen in the spring of 1889.

Totanus flavipes.—Sometimes seen in the fall.

Totanus solitarius.—Common about ponds and marshy places, have observed it till the first week in June, then not till after the middle of July, when it remains till the end of August.

Actitis macularia.—Common on the banks of streams and ponds, breeds.

Charadrius dominicus.—A fall migrant.

Ægialitis vocifera.—A common summer resident appearing in March, breeds.

Colinus virginianus.—Very rare in this locality now, not observed breeding for many years.

Bonasa umbellus.—A few resident in the locality.

Ectopistes migratorius.—Becoming rare, a flock of eleven seen June 10, 1885, only odd ones seen since.

Zenaidura macroura.—One procured in 1889, may become more common.

Accipiter velox.—Not common, one nest of four eggs taken May 24, 1882.

Accipiter cooperi.—Rather common, appearing about the first of April; the most destructive of our hawks to young poultry, pigeons, and wild birds.

Buteo borealis.—Fairly common in summer, arrives about the middle of March, may breed.

Buteo lineatus.—Common, arriving about March 21, breeds here.

Buteo latissimus.—Common, may breed.

Archibuteo lagopus sancti-johannis.—Captured one specimen in a trap, rare.

Falco columbarius.—Occasionally observed.

Falco sparverius.—Common, nests in holes in trees mostly those of Woodpeckers.

Asio wilsonianus.—A few have been taken here.

Asio accipitrinus.—Have seen several specimens in local collections.

Syrnium nebulosum—Commonly met with in spring, may breed.

Scotiaptex cinerea.—A few observed, mostly in winter.

Nyctala acadica.—Rather rare, may possibly breed.

Megascops asio.—Common in winter.

Bubo virginianus.—Occasionally met with in dense woods, doubtless breeds.

Nyctea nyctea.—A rare winter visitor.

Coccyzus americanus.—Rare, one nest of two eggs taken July 20, 1884.

Coccyzus erythrophthalmus.—A common summer resident, breeds.

Ceryle alcyon.—A common resident, nests in self-made burrows.

Dryobates villosus.—A common resident, breeds here.

Dryobates pubescens.—Occasionally observed at all times of the year.

Picoides arcticus.—A pair frequented my farm from the fall of 1888 to spring of 1889, one captured at Elma, in June.

Sphyrapicus varius.—A common summer resident, breeds, arrival and departure uncertain.

Ceophlœus pilœatus.—Very rare, once more common.

Melanerpes erythrocephalus. — A common summer resident, breeding on the margins of the woods.

Colaptes auratus.—A common summer resident from the end of March to middle of October, breeds here.

Antrostomus vociferus.—Common from May to October, breeds here.

Chordeiles virginianus.—A common summer resident, breeds.

Chætura pelagica.—An abundant summer resident, breeding in outhouses, chimneys, and hollow trees.

Trochilus colubris.—A common summer resident, probably nests

Tyrannus tyrannus.—Common from middle of May to September.

Myiarchus crinitus.—Heard mostly in May and June.

Sayornis phœbe.—Common from first of April, to middle of October, mostly about water, breeds.

Empidonax pusillus traillii.—Common in certain woods, several nests seen.

Empidonax minimus.—Common, breeds.

Cyanocitta cristata.—A resident, sometimes seen in large flocks, a few breed.

Corvus corax sinuatus.—Two pair have been observed.

Corvus americanus.—Very common from middle of February to November, specimens have also been seen in other winter months, breeds.

Dolichonyx oryzivorus. — Bob-o-link, common summer resident, breeds.

Molothrus ater.—Cow-bird, common summer resident, generally seen in flocks.

Agelaius phœniceus. — Red-winged Black-bird, common, arrives about March 20, last seen in middle of October.

Sturnella magna.—Meadow Lark, common summer resident, breeds.

Icterus galbula.—Baltimore Oriole, a summer resident in town and country, breeds.

Scolecophagus carolinus. — Rusty Grackle, migratory visitor' formerly nested.

Quiscalus quiscula æneus.—Crow Blackbird, abundant summer resident, breeds.

Coccothraustes vespertina.—Evening Grosbeak, a rare winter visitor, one seen December 12, 1889, two flocks previously seen, data not taken.

Pinicola enucleator.—Pine Grosbeak, specimens seen nearly every winter, abundant in the winter of 1884.

Carpodacus purpureus.—Purple Finch, common summer resident, nests in Balsam plantations.

Loxia leucoptera.—White-winged Crossbill, occasionally collected.

Loxia curvirostra minor.—Red Crossbill, flocks seen every winter, nest taken.

Acanthis hornemannii exilipes—Hoary Redpoll, one pair collected March 15, 1890.

Acanthis linaria.—Redpoll common in large flocks every winter.

Spinus tristis.—Goldfinch, abundant summer resident, sometimes seen in winter, nests.

Spinus pinus.—Pine Siskin, common winter visitor, observed from December to April.

Plectrophenax nivalis.—Snowbunting, observed in large flocks, from November to end of March.

Calcarius lapponicus.—Lapland Longspur, a rare winter visitor.

Poocætes gramineus.—Vesper Sparrow, common from middle of April to October, breeds.

Ammodramus sandwichensis savanna. — Savanna Sparrow, common in meadow and pasture fields, breeds.

Zonotrichia leucophrys.—White-crowned Sparrow, common from middle of April to middle of May, not noticed in the fall.

Zonotrichia albicollis.—White-throated Sparrow, common summer resident, breeds.

Spizella monticola.—Tree Sparrow, migratory visitor.

Spizella socialis.—Chipping Sparrow, common summer resident, breeds.

Junco hyemalis.—Black Snowbird, common resident, breeds, seen sparingly in winter.

Melospiza fasciata.—Song Sparrow, abundant, breeds.

Melospiza georgiana.—Swamp Sparrow, occasionally seen.

Passerella iliaca.—Fox Sparrow, rare migrant.

Pipilo erythrophthalmus.—Towhee, becoming more common, may breed.

Habia ludoviciana.—Rose-breasted Grosbeak, common especially in low thick hardwoods, nests.

Passerina cyanea.—Indigo Bunting, common on the margins of second growth woods, nests.

Piranga rubra.—Summer Tanager, a few specimens seen.

Piranga erythromelas.—Scarlet Tanager, not common, a few nests seen.

Progne subis.—Purple Martin, a common summer resident, in the Town.

Petrochelidon lunifrons.—Cliff Swallow, common, nests in colonies.

Chelidon erythrogaster.—Barn Swallow, abundant summer resident breeds.

Tachycineta bicolor.—Tree Swallow, a common summer resident, nests in Town and country.

Ampelis garrulus.—Bohemian Waxwing, occasionally observed in winter, sometimes in large flocks in spring.

Ampelis cedrorum.—Cedar Wax-wing, common from end of May to middle of August, nests.

Lanius borealis. — Northern Shrike, observed singly in winter, sometimes in flocks, from two to six, carries its prey in claws and beak.

Lanius ludovicianus excubitorides. — White-rumped Shrike, observed from early in April to last of October, local in distribution, nests in thorn trees.

Vireo olivaceus.—Red-eyed Vireo, common, breeds.

Vireo gilvus.—Warbling Vireo, not common, heard in Orchards and deep woods.

Vireo flavifrons.—Yellow-throated Vireo, summer resident.

Vireo noveboracensis.—White-eyed Vireo, one collected in middle of October 1890.

Mniotilta varia.—Black and White Warbler, common, several nests seen.

Helminthophila chrysoptera.—Golden-winged Warbler, generally observed in early summer, one nest taken.

Helminthophila ruficapilla.—Nashville Warbler, rarely seen in spring, may breed.

Compsothlypis americana.—Parula Warbler, a few noticed.

Dendroica æstiva.—Yellow Warbler, common, breeds.

Dendroica cærulescens.—Black-throated Blue Warbler, common in several high woods, several nests seen.

Dendroica coronata.—Myrtle Warbler, occasionally met with in certain damp woods, one nest taken.

Dendroica cærulea. — Cærulean Warbler, generally noticed in summer, may nest.

Dendroica pensylvanica.—Chestnut-sided Warbler, common in low second growth hardwood, nests.

Dendroica castanea.—Bay-brested Warbler, casually noticed, one nest taken.

Dendroica striata.—Blackpoll Warbler, occasionally observed in spring and early summer, also in August, may breed.

Dendroica blackburniæ.—Blackburnian Warbler, a spring visitor.

Dendroica vigorsii.— Pine-creeping Warbler, a few specimens observed

Seiurus aurocapillus. — Oven-bird, common summer resident, breeds.

Seiurus noveboracensis.—Water Thrush, common in low swampy woods, heard from first of May to last of August, breeds.

Geothlypis agilis.—Connecticut Warbler, an occasional resident on the margin of certain low woods, several nests taken.

Geothlypis philadelphia.—Mourning Warbler, occasional resident, one nest taken.

Geothlypis trichas.—Maryland Yellow-throat, a summer resident becoming more common, no nest yet taken.

Sylvania canadensis.—Canada Warbler, met with in certain low swampy woods, several nests taken, last in June 5, 1888.

Setophaga ruticilla.—American Redstart, abundant in all high hardwood, nests.

Anthus pensilvanicus. — Titlark, abundant spring and autumn visitor.

Galeoscoptes carolinensis. — Catbird, common summer resident breeds.

Harporhynchus rufus.—Brown Thrasher, seen for the first time in this vicinity, July 1889, may become more common and breed.

Troglodytes aëdon. — House Wren, common summer resident, breeding in town and country,

Troglodytes hiemalis.—Winter Wren, common in swampy woods, a number of nests observed.

Certhia familiaris americana.—Brown Creeper, common in swampy woods, several nests taken.

Sitta carolinensis. — White-bellied Nuthatch, common resident, breeds.

Sitta canadensis. — Red-bellied Nuthatch, occasionally observed, more common in evergreen woods in winter than in summer.

Parus atricapillus.—Chicadee, common resident, breeds.

Regulus satrapa.—Golden-crowned Kinglet, a common winter resident.

Regulus calendula.—Ruby-crowned Kinglet, uncommon spring visitor, not observed in autumn.

Polioptila cærulea.—Blue-gray Gnatcatcher, occasionally observed in spring, may breed.

Turdus mustelinus.—Wood Thrush, a common summer resident, breeds.

Turdus fuscescens.—Wilson's Thrush, not so common as the Hermit Thrush, breeds.

Turdus ustulatus swainsonii.—Olive-backed Thrush, a rare spring visitor.

Turdus aonalaschkæ pallasii.—Hermit Thrush, common, breeds.

Merula migratoria.—Robin, abundant summer resident, breeds.

Sialia sialis.—Blue-bird, abundant summer resident, breeding in town and country.—W. L. KELLS.

More Passerella iliaca.—On April 17, I shot another Fox Sparrow on Well's Hill, and on April 19, I secured one in University grounds out of the flock mentioned before. It is remarkable that these birds, which have seldom been seen in Toronto in the spring, and only as stragglers in the fall, should come in such numbers this year, and at such an unusal time.

Antrostomus vociferus.—On April 19, I secured the first specimen of the Whip-poor-will, and first Pine Warbler, *Dendroica vigorsii*, on Well's Hill; and on April 29, I saw five Chimney Swifts, *Chætura pelagica*, sailing around the ruins of the University. Migration has seemingly lulled for a while, and the arrivals have departed for the north, leaving our woods ready for another consignment.—G. E. ATKINSON.

After the reports were taken an Editing Committee composed of Dr. Brodie, J. R. Thurston, H. H. Brown, and G. E. Atkinson was appointed to look after the editing of the proceedings.

(Twenty-eighth Meeting, May 13.)

Seiurus aurocapillus on Yonge Street.—On May 9, I was handed a fine Oven-bird, which was secured by a boy in a lane on the south-east corner of King and Yonge Streets.—J. A. VARLEY.

Megascops asio.—On April 27, I found a nest of the Screech Owl about five miles east of Victoria Park. It was in a hollow stump about seven feet from the ground and the cavity was eight or nine inches deep, lined with a few feathers and contained five fresh eggs.

Arrivals.—On May 4, I observed the first Brown Thrasher, *Harporhynchus rufus*, Cat-bird, *Galeoscoptes carolinensis*, and Oven-birds, *Seiurus aurocapillus*, in Rosedale.—JOHN L. JACKSON.

Arrivals.—May 3, Ruby-throated Humming Bird, *Trochilus Colubris*, Virginia Rail, *Rallus virginianus*. May 4, Florida Gallinule,

Gallinula galeata. May 6, Least Bittern, *Botaurus exilis.* May 8, Long billed Marsh Wren, *Cistothorus palustris.* May 10, American Pipit *Anthus pensilvanicus.*—JOHN EDMONDS.

Arrivals.—May 3, Black-throated Blue Warbler, *Dendroica cærulescens*, Parula Warbler, *Compsothlypis americana.*

Sparrows eating buds.—On May 13, I saw a flock of about fifty White-throated Sparrows, *Zonotrichia albicollis*, and White-crowned Sparrows, *Zonotrichia leucophrys*, eating the buds of a maple tree, in the University Grounds.

Sialia sialis nesting.—On May 3, I found a nest of the Blue-bird in the Cricket Grounds. It had contained eggs but they were taken.

Albino Spizella socialis.—On May 9, I secured a bird which I had noticed around the University Grounds since May 1, but had been unable to secure it. It seemed a new bird in appearance, but its song resembled that of the Chipping Sparrow, and upon examination it proved to be an albino of the above species.—CHAS. E. PEARSON.

April 30.—I received three Caspian Terns, *Sterna tschegrava*, which were killed out of a flock of about fifty, they were all females.

Green Heron.—A fine specimen of *Ardea virescens*, was shot in Toronto Marsh and brought to me on April 30.

May 8.—I received another Caspian Tern, which was also a female.

Chicadees nesting.—On May 12, while at the Humber, I found three pair of the above *Parus atricapillus*, busy preparing their nests. One stump containing a nest had three or four holes started and left evidently proving too hard for the little workers. The same day I saw a pair of Mourning Warblers, *Geothlypis philadelphia.*

Ectopistes migratorius, at Humber.—On May 12, at the Humber I heard a cooing in the distance and following it up I came across a beautiful male Passenger Pigeon, and got within easy range but unfortunately had only a charge of small shot which failed to bring down the prize.

Nests found.—On the same day I saw Kingfishers, *Ceryle alcyon*, building, and found nest of Song Sparrow, *Melospiza fasciata*, containing four eggs.

May 2.—I received the first Scarlet Tanager *Piranga erythromelas.* —WM. CROSS.

Arrivals and collections.—April 30, I saw the first Brown Thrashers, *Harporhynchus rufus*, in the University Grounds. May 2, saw the first

Yellow Warbler, *Dendroica æstiva*. May 3, secured two males and one female Red Crossbill, *Loxia curvirostra minor*, at the same place. May 4, saw first Crested Flycatcher, *Myiarchus crinitus*, on Well's Hill.

Sparrows eating beech buds.—May 5, I watched a flock of *Passer domesticus*, eating beech buds in the University Grounds. They go in flocks of about 20, from tree to tree and destroy the buds at the rate of about 5 per minute for each bird. They cut the buds off close to the twig, eat the soft pip and drop the shells. On May 11, I also saw three Rose-breasted Grosbeaks feeding at the same place and in the same manner, occasionally darting out at a passing insect. I managed to secure one and its stomach was packed with these buds.

More arrivals.—May 6, Oven-bird, *Seiurus aurocapillus*. May 10, Rosebreasted Grosbeak, *Habia ludoviciana*, Blueheaded Vireo, *Vireo solitarius*. May 13, Bob-o-link, *Dolichonyx oryzivorus*, Catbird, *Galeoscoptes carolinensis*.—G. E. ATKINSON.

Twenty-ninth meeting, May 27, 1890),

Arrivals.—May 19, *Tyrannus tyrannus*, Kingbird. *Sylvania pusilla*. Wilson's Warbler. *Sylvania canadensis*, Canadian Warbler.

Observations and collections, at Orillia, Ont.—I secured three Baltimore Orioles, *Icterus galbula*, and several Warblers on May 24. May 25, secured a male Maryland Yellow-throat, *Goethlypis trichas*.

Nests.—May 26, at Orillia, I found a nest of *Quiscalus quiscula æneus*, Bronzed Grackles, containing four full fledged young birds. One nest of Chipping Sparrow, *Spizella socialis*, containing two eggs, and one nest of the Barn Swallow, *Chelidon erythrogaster*, containing four eggs —G. E. ATKINSON.

Migration at its height.—On May 3, in Rosedale, I saw large numbers of Warblers, among them were the Chestnut-sided, *Dendroica pensylvanica*, Blackburnian, *Dendroica blackburniæ*, and one Cerulean Warbler, *Dendroica cærulea*. May 24, a Mourning Dove, *Zenaidura macroura*, was secured at Little York, also three Baybreasted, *Dendroica castanea*, one Cerulean Warbler, *Dendroica cærulea*, and one Cape May Warbler, *Dendroica tigrina*, were brought to me. I also secured several specimens of the Ruby-throated Hummingbird, *Trochilus colubris*, which are very numerous this season; a male specimen of

Ardea virescens, Green Heron, was shot at the Humber and brought to me on May 24.

A new species for Ontario.—On May 18, a very interesting capture was made on Toronto Island, and I afterwards received the bird; it was a small Bittern with all the colorings very dark and blended into rich chestnut brown on the back. It was so unlike the Least Bittern that I put it down as a new bird and soon identified it as *Botaurus neoxenus*, Cory's Least Bittern. It is a resident of Florida and Mexico, and is supposed to have wandered up here with our *Botaurus exilis*, during migration.—W. CROSS.

(Thirtieth Meeting, June 3).

Another rare species.—On May 23, a Gull was brought to my store. It had been shot on Toronto Island and being unlike any of our native species I had it thoroughly examined and it proved to be a male Laughing Gull, *Larus atricilla*. This is, I believe, the first record of this bird for Ontario.

Other rare birds.—June 2, I received a female Wilson's Phalarope *Phalaropus tricolor*, in full breeding plumage shot at Toronto Marsh. Also one Black Tern, *Hydrochelidon nigra surinamensis*, and on May 28, one Caspian Tern, *Sterna tschegrava*, and one Yellow-billed Cuckoo, *Coccyzus americanus*.—WM. CROSS.

Coccyzus erythrophthalmus.—The first Black-billed Cuckoo was secured on Well's Hill on May 28.

Mature Accipiter atricapillus.—On June 2, on Well's Hill I heard crows raising a disturbance and on investigating I saw a large Hawk fly to the top of a tree near by. I at once identified it as an adult Goshawk. I fired but the charge was too light and I did not secure him.—G. E. ATKINSON.

Passerina cyanea.—On June 3, I saw the first Indigo Bunting at Kew Gardens.—J. A. VARLEY.

(Thirty-first meeting, June 17).

Seiurus motacilla, at the Credit.—On August 23, 1888, I collected a young female of the Large-billed Water Thrush, on the Credit River, about five miles north of Lake Ontario. This I believe is the most

northern record for the species in Ontario. Its dimensions are:—length 5.88; extent, 10; wing, 3.19; tail, 2.06; beak, .51. It was in fair condition, and had been feeding on grasshoppers and coleoptera.—ERNEST E. THOMPSON.

Arrivals &c.—On May 21, at Well's Hill I shot an adult female Broad-winged Hawk, *Buteo latissimus*, and secured the first Baybreasted Warbler, *Dendroica castanea*, and a Yellow-bellied Flycatcher *Empidonax flaviventris*.—H. H. BROWN.

Albino Passer domesticus.—Since June 10, I have observed a sparrow, which is completely white, in company with others of its species, around the Woodbine Race Track, but as yet have not secured it.—JAS A. VARLEY.

June 7.—I received a Marbled Godwit *Limosa fedoa*, and a Northern Phalarope, *Phalaropus lobatus*, one specimen of Black Tern, *Hydrochelidon nigra surinamensis*, and on June 14, a full plumaged Night Heron, *Nycticorax nycticorax nævius*, and White-rumped Sandpiper, *Tringa fuscicollis*, all collected on Ashbridge's Bar.—W. CROSS.

Towhee's nest.—On May 25, I found a nest of *Pipilo erythrophthalmus*, in Rosedale. It contained four fresh eggs and was constructed of grape-vine bark lined with coarse grass.

Coccyzus americanus, in Union Station.—On May 29, I was given a female Yellow-billed Cuckoo, which was caught about 4 a.m. while roosting in the Union Station; and on May 30, I received a Virginia Rail *Rallus virginianus*, caught in the same place where they had evidently gone to roost.

Nests found.—On May 31, I found a nest of the Savannah Sparrow *Ammodramus sandwichensis savanna*, containing four eggs; two of the Sora, *Porzana carolina*, one containing six, and the other two eggs, also several nests of Red-winged Blackbirds, *Agelaius phœniceus*, some with eggs and some with young in. June 4, one nest of Spotted Sandpiper, *Actitis macularia*, containing four fresh eggs. June 7, several nests of Bank Swallow, *Chelidon erythrogaster*, with eggs at different stages of incubation, and several nests of Purple Martin, *Progne subis*, and Tree Swallow, *Tachycineta bicolor*. These two latter seem to have two nests containing eggs at the same time, as the boxes examined contained two nests and eggs each, while only one pair of each of the birds were observed.

Trochilus colubris nest.—While collecting east of Toronto on June 7, I was attracted by a Humming Bird which was flying around my head;

on following it I discovered its nest on the bough of a small cedar about ten feet from the ground. The mother came and sat on the eggs three times while I was watching it but I could not secure her. The nest contained two eggs which were partly incubated.

Carpodacus purpureus.—On June 14, I approached a pair of Purple Finches in the Queen's Park. I managed to get close enough to strike one of them with a stick, and captured it.—CHAS E. PEARSON.

Bonasa nest in Rosedale.—On June 9, I found a nest of the Ruffed Grouse, *Bonasa umbellus togata*, in Rosedale. It contained fifteen eggs, all but three of which had been hatched and the young gone. The shells of each egg had been cut around the large end and the young let out, and the large end turned inside the remainder of the shell, so that every shell was quite complete, two of the remaining three were bad and the third contained a dead bird. The nest was in a small depression on the side of a ravine. The same day I found a nest of Wilson's Thrush, *Turdus fuscescens*, containing three of its own eggs, and one of the Cowbird *Molothrus ater*, at the same place.—G. E. ATKINSON.

Migration observations, from Port Sydney.—The following is a list of the dates on which the different birds arrived here last spring, and a comparison with the arrivals up to April 1890. *Acanthis linaria*, Redpoll arrived January 25, 1889, November 1, 1889, much earlier. *Otocoris alpestris praticola*, Shorelark, March 5, 1889, Feburary 27, 1890, much earlier. *Spizella monticola*, Tree Sparrow, March 11, 1889, April 7, 1890, later. *Junco hyemalis*, Junco, March 17, 1889, April 7, 1890, later. *Merula migratoria*, Robin, March 22, 1889, April 23, 1890, later. *Sialia sialis*, Blue-bird, March 22, 1889, April 25, 1890, later. *Larus argentatus*, Herring Gull, March 22, 1889, March 18, 1890, earlier. *Melospiza fasciata*, Song Sparrow, March 24, 1889, April 7, 1890, later. *Scolecophagus carolinus*, Rusty Grackle, April 1, 1889, April 9, 1890, later. *Quiscalus quiscula æneus*, Bronzed Grackle, April 9, 1889, April 9, 1890, same. *Sphyrapicus varius*, Yellow-bellied Sapsucker, April 11, 1889, April 12, 1890, later. *Colaptes auratus*, Flicker, April 11, 1889, April 12, 1890, later. *Spinus tristis*, American Goldfinch, April 11, 1889, April 10, 1890, earlier. *Sayornis phœbe*, Phoebe, April 11, 1889, April 14, 1890, later. *Accipiter velox*, Sharp-shinned Hawk, April, 16, 1889, April 12, 1890, earlier. *Falco sparverius*, Sparrow Hawk, April 16, 1889, April 12, 1890, earlier. *Contopus virens*, Wood Pewee, April 16, 1889, not yet come, later. *Poocætes gramineus*, Vesper Sparrow, April 16, 1889, April 11, 1890, earlier. *Ceryle alcyon*, Kingfisher, April 16, 1889, April 12, 1890, earlier. *Troglo-*

dytes hiemalis, Winter Wren, April 4, 1889, April 9, 1890, later. *Turdus fuscescens* Wilson's Thrush, April 16, 1889, April 17, 1890, later. *Ardea herodias* Blue Heron, April 12, 1889, April 3, 1890, earlier. *Regulus calendula*, Ruby-crowned Kinglet, April 4, 1889, April 11, 1890, later. *Regulus satrapa*, Golden-crowned Kinglet, April 4, 1889, April 11, 1890, later. *Passerella iliaca*, Fox Sparrow, April 17, 1889, April 17, 1890, same. *Zonotrichia albicollis*, White-throated Sparrow, April 20, 1889, April 17, 1890, earlier. *Tachycineta bicolor*, Tree Swallow, April 17, 1889, April 17, 1890, Same. *Urinator imber*, Loon, April 20, 1889, April 20, 1890, Same. *Spizella socialis*, Chipping Sparrow, April 20, 1889, April 20, 1890, same. *Archibuteo lagopus sancti-johannis*, Rough-legged Hawk, April 22, 1889, April 22, 1890, same. *Botaurus lentiginosus*, American Bittern, April 24, 1889, April 24, 1890, same.

Northern migrants wintering.—The following birds came down from the north and remained with us *Nyctea nyctea*, Snowy Owl; *Perisoreus canadensis*, Canada Jay; *Picoides arcticus*, Arctic Woodpecker; *Pinicola enucleator*, Pine Grosbeak; *Acanthis linaria*, Redpoll.

Resident birds at Port Sydney.—The following birds are resident with us summer and winter, *Ceophlœus pileatus*, Pileated Woodpecker; *Dryobates villosus*, Hairy Woodpecker; *Dryobates pubescens*, Downy Woodpecker; *Sitta carolinensis*, White-breasted Nuthatch; *Sitta canadensis*, Red-breasted Nuthatch; *Carpodacus purpureus*, Purple Finch; *Spinus tristis*, Goldfinch; *Cyanocitta cristata*, Blue Jay; *Loxia curvirostra minor*, Red Crossbill; *Loxia leucoptera*, White-winged Crossbill; *Parus atricapillus*, Chickadee; *Bubo virginianus*, Great-horned Owl; *Syrnium nebulosum*, Barred Owl; *Megascops asio*, Mottled Owl; *Nyctala acadica*, Saw-whet Owl; *Scotiaptex cinerea*, Great Gray Owl; *Lophodytes culcullatus*, Hooded Merganser. Our rivers are very much cut up by rapids around which there is always open water which is frequented by this duck and a few other species, which always find plenty of food. During the coldest weather I have seen flocks of as many as twenty, sporting around among the ice as contented as in mid-summer.

Rare birds at Port Sydney.—Ten years ago the Red-headed Woodpecker, *Melanerpes erythrocephalus*, was a very rare bird here, but is now very numerous; within the last 27 years, the Meadow Lark, *Sturnella magna*, has introduced itself, is likewise becoming common, and it is only three years since the first Shore Lark, *Otocoris alpestris praticola*, appeared and has become common. The Cow-bird, *Molothrus ater*, has not reached us yet. Two years ago I collected a Baltimore Oriole,

Icterus galbula, the only specimen ever collected here, and I also collected the only male and female Towhee *Pipilo erythrophthalmus*, ever taken here. On May 6, 1890, I collected a Black-throated Green Warbler, *Dendroica virens*, which are just becoming common.

Nesting of Sitta canadensis, and Parus atricapillus. — Last summer I found a nest of the Red-breasted Nuthatch, it was dug in a rotten stump about five feet from the ground, and contained young birds almost able to fly. Around the entrance to the nest was a ring of pine or balsam gum, and as I saw the young birds picking at it I inferred it was an insect trap. I also found three nests of the Chickadee, and each was lined with the hair of the *Lepus americana*.

Kingfisher nesting.—Last summer I saw two nests of the *Ceryle alcyon*, one containing seven eggs and the other six. In the first I caught the male and in the second the female, which goes to show that the male assists in the incubation.—A. KAY, Port Sydney, Muskoka.

Nesting of Ontario birds.—From a paper read before the Biological Section May 26.

Coccyzus erythrophthalmus.—In July 1885, I saw a Black-billed Cuckoo, fly off a Wood Pewee's nest, in an orchard on Bathurst Street; and in July 1886, I saw another come off a Yellow Warblers nest in the same orchard, I got both eggs. There is no doubt that it was the Black-billed Cuckoo, as I shot the bird which came off the Pewee's nest.

Dryobates pubescens.—I find a Downy Woodpecker's nest, every year in a dead tree about fifteen feet from the ground.

Colaptes auratus.—I have found the Flickers' nesting every year, but in May 1889, I found a nest which caused a great deal of interest. It contained three fresh eggs, and hearing of the strange habit of laying a fresh egg every morning whether disturbed or not, I took the three eggs and returned next day and got another, and the next day I got the fifth. I visited the nest regularly every morning, and always got an extra egg until I got twenty eggs out of the nest. This settled it, and she left, but I saw her at another tree near by a few days later; she was evidently preparing another nest, this time higher up. I got up and found this hole about a foot deeper than the first being about twenty or twenty-two inches deep, it was empty so I watched her to see if I would get another haul but not so. Although I saw her at the hole every day, and got up two or three times a week I could find nothing until one Sunday morning July 20, I saw her sitting beside the hole, and seemingly pecking at something inside. I frightened

her off, and at the same time looked up at the hole, and saw five heads come out, and then two young birds fly out. I at once scrambled up the tree, and caught the last one by the feet, as he was going off. In the meantime my friend was engaged with one which fell in the creek. Taking a stick he shoved the bird to the opposite shore, and as he crossed, it scrambled across the sand, and then up a tree.

Chordeiles virginianus.—Nests found occasionally on flat-roofed houses.

Chætura pelagica.—Swifts' nests are taken nearly every year from chimneys, in Toronto.

Tyrannus tyrannus.—I have taken the Kingbird's nests occasionally from the tops of pines.

Myiarchus crinitus.—I have found two or three nests of the Crested Flycatcher, in holes in dead trees. In 1887 I found one nest in a tree about fifty feet from the ground, directly over a Higholders nest with whom the male bird used to fight for the only branch on the tree, and I may say he always came off victorious, and has nested in the same tree every summer since then.

Contopus virens.—I find the Wood Pewee's nests every season generally in an orchard, in the crotch of an apple tree.

Agelaius phœniceus.—The Red-wing Blackbird nests may be found quite plentifully around any marsh, and I have found several every year.

Sturnella magna.—Found one nest of Meadow Lark in 1886 on Well's Hill, and in 1888 I found one nest on Don Flats, and in 1889 one on Spadina Road.

Icterus galbula.—I found the nest of the Oriole in 1884 and 1886, on Bathurst Street, and in 1889 I found three near West Toronto. I find that this bird builds its nest with only one hole to enter, and after the eggs are laid she makes a second hole, and goes in one side, and off the other. I say this because I have found the nests with fresh eggs in, and they only had the one hole, while every old nest I have examined, and all those which contained young birds were either open altogether at the top, or had two holes.

Quiscalus quiscula æneus.—The Bronzed Grackle is not found in the woods surrounding the city, the only chance that remains to get them is in the private grounds in the city where they breed in large numbers every year.

Spinus tristis.—The American Goldfinches breed every year in and about the city.

Poocætes gramineus.—Vesper Sparrows' nests are likewise quite common in the fields around the city.

Ammodramus sandwichensis savanna.—The Savannah Sparrow's nests are occasionally found, but not as common as the Vesper.

Spizella socialis.—Chipping Sparrows' nests very common all over, but the number is fast decreasing since the introduction of the *Passer domesticus.*

Melospiza fasciata.—The Song Sparrows' nests are the commonest of all our native birds' nests. While at Linwood, Ont., in May, 1889, I was standing by the gate on Sunday morning 5th, when I heard something flutter, and turning saw a bird come out of a hole in the gate post. On examining the nest I found one egg: being anxious to capture the bird alive, I watched the hole but she did not go back that day, and next day I looked and found two eggs, and on the third and fourth morning I found an extra egg; on the fifth morning I caught her just as she entered the nest, and about half an hour afterwards she laid the fifth egg in the cage During the four days of laying she had not sat on the eggs either day or night, and only for about half an hour each morning while laying. The same condition holds good among all the other birds I have observed, except one Catbird.

Towhee, *Pipilo erythrophthalmus.*—One nest found in a pile of brush on Well's Hill in 1888.

Indigo Bunting, *Passerina cyanea.*—Found occasionally in raspberry bushes.

Progne subis.—The Purple Martins breed around the high buildings on the main streets of the city, and are therefore hard to get.

Chelidon erythrogaster.—Barn Swallow found common every year.

Tachycineta bicolor.—Tree Swallows nest every year in the bird-houses around the city.

Petrochelidon lunifrons.—Cliff Swallows and *Clivicola riparia*, Bank Swallows are to be found in thousands in the high banks on the lake shore east and west of Toronto, and in July, 1888, I dug out one nest of the *Stelgidopteryx serripennis*, Rough Winged Swallow out of a nest which was among the others at Long Branch.

Ampelis cedrorum.—Find two or three every season in the orchards about the city.

Vireo olivaceus.—The Red-eyed Vireo's nests are found occasionally but may be more commpn than supposed to be.

Dendroica æstiva.—The Yellow Warbler's nests are to be found everywhere, and every season, and are generally the depositary of the Cowbird.

Dendroica blackburniæ.—In 1885 I found one nest of the Blackburnian Warbler in a cedar tree north of Well's Hill. It was the only nest of this species I ever saw here. It resembled that of the *D. æstiva*, but a little smaller and shallower, it contained two eggs which were marked very much similar to those of the Yellow Warbler.

Seiurus aurocapillus.—Oven-bird found occasionally on Well's Hill.

Setophaga ruticilla.—Redstart nests are found occasionally in the deeper bushes north of the hill.

Galeoscoptes carolinensis.—I find the Catbird's nests every year, but in July 1885 I found a nest on the hill which contained one fully fledged bird, one fresh egg and one addled egg. I took the addled egg and the young bird, and returned in about two weeks and got another full fledged bird. This is the only case I have known of fresh eggs and young birds being found in the same nest around Toronto.

Harporhynchus rufus.—I have found two or three Thrasher's nests among the low scrub on the hill.

Troglodytes ædon.—House Wrens' nests can be found in almost every orchard or bit of bush around the city. They build in holes in the side of a house or in a tree.

Cistothorus palustris.—The Long-billed Marsh Wren's nests are abundant in Toronto Marsh every year.

Parus atricapillus.—Have found Chicadees' nests every year in old stumps.

Turdus fuscescens.—The nests of Wilson's Thrush are to be found every year quite common in the deep woods.

Merula migratoria.—The Robin's nest is about the most familiar to all collectors, and is by far the most plentiful both in and outside the city.

Sialia sialis.—I find about two Blue-birds' nests every year, generally in a hole in a tree or post, with a small hole just big enough to admit the

bird, but, in 1889, I found one nest on Spadina Road in the stump of an apple tree, where the hole was about three inches broad and the nest was only about three inches below the level of the hole; it contained five eggs.—G. E. ATKINSON.

(Thirty-Second Meeting, Sept. 23, 1890.)

Haliæetus leucocephalus.—On Sept 15, I received a fine Bald Eagle from Pickering, Ontario. It was a very large specimen and had been seen repeatedly carrying away small lambs.

Buteo swainsoni.—A fine male specimen of the Swainson's Hawk was secured on the Don flats and brought to me on Sept. 5. This is the first specimen I ever received in the flesh and the first record of its occurrence about Toronto.—WM. CROSS.

Vireo solitarius.—On Sept. 17, I collected a specimen of the Blue-headed Vireo in Rosedale.—WM. METCALFE.

Albino Passer domesticus.—On June 21, I secured an entire albino English Sparrow at Kew Gardens, it was a female and had been setting. Its color was a dark cream on the breast and a few very light brown markings on the shoulders and back corresponding to the dark markings of the ordinary specimens and the wings and tail were all dirty white.

Aix sponsa. Buteo latissimus.—At Sparrow Lake, Muskoka, I found Wood Ducks and Broad-winged Hawks very numerous during August.—J. A. VARLEY.

Micropalama himantopus.—On July 28, I shot a fine Stilt Sandpiper on Ashbridge's Bar. This bird is considered very rare about Toronto.

Phalaropus tricolor.—On Sept. 15, while Mr. A. Bunker was watching for ducks off the Sandbar at the west end of the Island, a Wilson's Phalarope pitched among his decoys and was secured. This also is considered a rare capture in this vicinity.—T. HARMAR.

Summer Collections.—June 18th, *Calidris arenaria*, Sanderling, collected on Ashbridge's Bar; July 17, young Coot, *Fulica americana*, secured in the marsh.

Aythya affinis.—About July 21 there seemed to be an unusual migration of ducks and shore birds, several species of the former having

been secured, and flocks of Sandpipers were noticed about their usual haunts, and then for about a month they almost disappeared and very few specimens were seen.

Larus philadelphia.—On August 4, while returning from Port Credit, I secured two Bonaparte's Gulls, out of a large flock that were standing on pieces of floating wood in Humber Bay.

August 20.—I received a large Ring-billed Gull, *Larus delawarensis*, and a Pectoral Sandpiper, *Tringa maculata*, shot on Ashbridge's Bar.

Nycticorax nycticorax nævius.—On August 27, I secured a Night Heron, on Ashbridge's Bar. It was a female in the young plumage, but had evidently been incubating from the appearance of the skin on the belly. On the same date, I also secured a Marsh Hawk *Circus hudsonius*, at the same place.

On September 13.—I observed several of the Swallows, principally *Chelidon erythrogaster*, and *Tachycineta bicolor*, with a few specimens of *Clivicola riparia*, still frequenting the Bar. Mr. Loane informs me that the Swallows and Blackbirds do not migrate at night, and mentions that on several occasions while he was lying in the rushes, he saw them rise up just at daybreak, and circling round at a great height in the air, they would strike off in a straight line south; and in the spring he has seen immense flocks of these birds arrive and settle in the rushes between six and nine o'clock in the morning.

September 15.—I collected two Black and White Warblers, *Mniotilta varia*, one Pine Warbler, *Dendroica vigorsii*, and one Tennessee Warbler, *Helminthophila peregrina*, and a female Sharp-shinned Hawk, *Accipiter velox*.

September 17.—Received two Golden Plover, *Charadrius dominicus*, from Ashbridge's Bar.

September 20.—In Rosedale to-day, I collected one Nashville Warbler, *Helminthophila ruficapilla*, and one Blue-headed Vireo, *Vireo solitarius*.

September 20.—I received one Buff-breasted Sandpiper, *Tryngites subruficollis*, one Baird's Sandpiper, *Tringa bairdii*, one Bonaparte's Gull, *Larus philadelphia*, and one Greater Yellow-leg, *Totanus melanoleucus*, from Ashbridge's Bar.—J. R. THURSTON.

Totanus flavipes.—On August 7, I secured three species of the Lesser Yellow-leg, on Ashbridge's Bar.

Fall migrations begun.—On September 7, I noticed the first sign

of migration among the insectivorous birds. Redstarts, *Setophaga ruticilla*, and several other Warblers were to be seen in great numbers.

September 16. — I secured a young Maryland Yellow-throat, *Geothlypis trichas*, and a male Olive-back Thrush, *Turdus ustulatus swainsonii*, in the University Grounds.

September 21.—I observed numbers of White-throated Sparrows, *Zonotrichia albicollis*, in different parts of the city, and saw two Purple Finches, *Carpodacus purpureus*, in the University Grounds.—G. E. ATKINSON.

(Thirty-third Meeting, October 7, 1890.)

Port Sydney observations.—May 7, saw Brown Thrasher, *Harporhynchus rufus*, and Snowbirds, *Plectrophenax nivalis*.

May 14.—Saw three more Snowbirds.

May 18.—Saw a Maryland Yellow-throat, *Geothlypis trichas*.

May 23.—Secured an Olive-sided Flycatcher, *Contopus borealis*.

May 25.—Saw three male Towhees, *Pipilo erythrophthalmus*. This bird is becoming commoner every summer; a few years ago it was never seen here at all.

May 28.—Blue-headed Vireo, *Vireo solitarius*, also saw a flock of Pine Siskins, *Spinus pinus*, which stayed three days, and then went north.

August 15.—Great numbers of Swallows migrating south, rested on my farm fences for two days. Pipits, *Anthus pensilvanicus*, are also here now. They remain longer in the fall than the spring.—W. KAY, Port Sydney, Muskoka.

Troglodytes hiemalis.—On October 5, I observed the last Marsh Wren, in Toronto Marsh.—JOHN EDMONDS.

Accipiter atricapillus.—In October a male Goshawk was shot by a gunner on Ashbridge's Bay, as it flew at his duck decoys.—J. R. THURSTON.

Migration notes.—The last week of September, and first week of October, migration has been at its height. Sparrows, Warblers, Thrushes, and Blackbirds, are to be seen all about the city. White-throated Sparrows, *Zonotrichia albicollis*, Myrtle Warblers, *Dendroica coronata*,

Hermit Thrushes, *Turdus aonalaschkæ pallasii*, predominating among their respective groups.

Spinus tristis.—On October 5, I trapped twelve Goldfinches, between 10 a.m. and 4 p.m.

Zonotrichia albicollis.—On September 24, I caught two White-throated Sparrows, and between that date and October 7 I caught eighteen specimens, and one White-crowned Sparrow, *Zonotrichia leucophrys*, and one Swamp Sparrow, *Melospiza georgiana*. The White-throated Sparrows are exceedingly quarrelsome or I might have secured double the number as directly a second bird went on the nest the first comer would dash at him and drive him off, and I had to be contented with single birds generally, where I might have secured a dozen of any quiet dispositioned bird.—G. E. ATKINSON.

Holland River notes.—August 15 to August 19, were spent at Holland River, about forty-five miles north of Toronto, and a large number of birds were seen, and a few secured. On the morning of August 16, flocks of thousands of Red-winged Blackbirds, *Agelaius phœniceus* were seen near Holland Landing, and all down the river to Cook's Bay. Numbers of ducks, mostly Teal, were seen as well as quite a number of American Bittern, *Botaurus lentiginosus*, and Blue Herons, *Ardea herodias*, several young Black Terns, *Hydrochelidon nigra surinamensis*, and Common Terns, *Sterna hirundo*, were also flying about the marsh as if they had been breeding there. Coots, *Fulica americana*, Gallinules, *Gallinula galeata*, and different Grebes were common at the mouth of the river. We secured one Green-winged Teal, *Anas carolinensis*, three Bitterns, *Botaurus lentiginosus*, several Coots, *Fulica americana*, one Pigeon Hawk, *Falco columbarius*, three Yellow-legs, *Totanus flavipes*, several Blackbirds, and one Kingfisher, *Ceryle alcyon*, and J. R. Thurston secured a Coot's nest containing four eggs.—J. R. THURSTON, ED. DEACON, G. E. ATKINSON.

(Thirty-fourth Meeting, November 11th, 1890.)

Chordeiles virginianus.—On Sept. 27, Mr. J. Kelly disturbed a flock of about a dozen Night Hawks at Kew, evidently migrating. On Oct. 4, I secured a pair of Towhees, *Pipilo erythrophthalmus*, at Victoria Park, also one male Black-throated Green Warbler, *Dendroica virens*. On Nov. 1, I observed a flock of about eight Snowbirds, *Plectrophenax nivalis*. —J. A. VARLEY.

Asio wilsonianus.—On Nov. 6, I secured a female Long-eared Owl in Rosedale.—WM. METCALFE.

Passerella iliaca.—For about a week Fox Sparrows have been quite common about the city. On Oct. 12, on Well's Hill, I saw a flock of about twenty, in company with Juncos; but on Oct. 13, I secured three specimens, and the same afternoon I trapped another in an orchard near our place. On Oct. 14, I secured three more on Well's Hill. The other Sparrows are equally plentiful.—G. E. ATKINSON.

Holland River Notes.—On Oct. 17, a party of four took a trip to Holland River to do some collecting among the water-fowl and marsh birds. On Oct. 18, large flocks of Rusty Grackles, *Scolecophagus carolinus*, were observed all the way down the river and about the shanty small flocks of Swamp Sparrows, *Melospiza georgiana*, Song Sparrows, *Melospiza fasciata*, Red-wing Blackbirds, *Agelaius phœniceus*, Cowbirds, *Molothrus ater*, and Rusty Blackbirds, were to be seen at all hours of the day until Oct. 31. On Oct. 18, a large flock of Bonaparte's Gulls, *Larus philadelphia*, were seen and several specimens secured. One specimen of Pied-billed Grebe, *Podilymbus podiceps*, was secured the same day. Oct. 20, several large flocks of Snowbirds, *Plectrophenax nivalis*, which remained around for about two weeks roving about and alighting on the rushes at the water's edge; three specimens alighted on the bow of our boat on one occasion while we were watching for Ducks. Oct. 21, a day was taken in the bush, and several Hairy Woodpeckers, *Dryobates villosus*, Downy Woodpeckers, *Dryobates pubescens*, Blue-jays, *Cyanocitta cristata*, Meadow Larks, *Sturnella magna*, and Ruffed Grouse, *Bonasa umbellus togata*, were observed, and a few Woodpeckers, and one Jay were secured, but no Partridge. In the evening of the same day O. Spanner shot one young and one adult male Caspian Tern, *Sterna tschegrava* and another Pied-billed Grebe. Oct. 22, one young Horned Grebe, *Colymbus auritus*, two Coots, *Fulica americana*, and three Yellow-legs, *Totanus flavipes*, were secured. Oct. 23, two Pied-billed Grebes, one Gallinule, *Gallinula galeata*, and two Coots. Oct. 26, three Red-backed Sandpipers, *Tringa alpina pacifica*, and one Virginia Rail, *Rallus virginianus*, seen. Oct. 28, large flocks of Yellow-legs observed and a few secured. Oct. 31, one young Holbœll's Grebe, *Colymbus Holbœllii*. On Oct. 20, a flock of about twenty Geese, and Oct. 28 another flock of about ten were seen flying south. Besides the above a number of ducks were secured consisting of Scaup Ducks, *Aythya marila nearctica*, Lesser Scaup Duck, *Aythya affinis*, first secured Oct 18. Oct. 20, Ring-necked Duck, *Aythya collaris*. Oct. 22, American Golden-eye, *Glaucionetta clangula americana*, Buffle-head, *Charitonetta albeola*,

Ruddy Ducks, *Erismatura rubida*, Black Duck, *Anas obscura*, Scoter, *Oidemia americana.* Oct. 25, Mallard, *Anas boschas*, Pintail, *Dafila acuta.* Oct. 26, Hooded Merganser, *Lophodytes cucullatus.* Oct 27, Redhead. *Aythya americana.*—G. E. ATKINSON.

Spizella monticola. Junco hyemalis. — On November 6, I collected several Tree Sparrows and Juncos, which were feeding in a stubble-field surrounded with trees on Well's Hill. On November 8, around the Bell-buoy at Lighthouse Point, I observed a large number of Winter Ducks, *Clangula hyemalis*, White-winged, and other Scoters, also several Herring Gulls, *Larus argentatus smithsonianus*, and Bonaparte's Gulls, *Larus philadelphia.* The first Cowheens were secured in the same locality, about October 11.—J. R. THURSTON.

Ectopistes migratorius.—A young female Passenger Pigeon was secured at Greenwood's Ave., on September 20.

Larus delawarensis.—Ring-billed Gulls have been numerous about Toronto Bay for some time, I have secured several specimens.—JOHN EDMONDS.

(Thirty-fifth Meeting, November 25, 1890.)

Buteo latissimus.—A young Broad-winged Hawk, collected by me on the Don Flats, on August 23, during the beginning of migration, —W. METCALFE.

Nyctala acadica.—A Saw-whet Owl was captured alive on a door-step opposite my house, on November 4, and came into my possession.—J. A. VARLEY.

Spizella monticola.—On November 15, I saw a flock of Tree Sparrows feeding in a piece of swampy ground, at the Humber. November 23, I saw a Red-tailed Hawk, *Buteo borealis* on Well's Hill. —E. DEACON.

Nyctala acadica. Passerella iliaca.—I secured one Fox Sparrow, on Well's Hill, on October 25 and on November 9 I secured a Saw-whet Owl at Lambton.—F. TWEED.

Antrostomus vociferus. Passerella iliaca. Plectrophenax nivalis.—On September 30, I secured a Whip-poor-will, which I consider late for this bird. October 4, I secured one Fox Sparrow, the first record, I believe, this fall. On October 25, I received a Snow-bird which was shot on Ashbridge's Bar in company with a few others. —H. H. BROWN.

(Thirty-sixth Meeting, December 9, 1890.)

Summer collections, and observations.—July 9, young *Fulica americana*, and Virginia Rail, *Rallus virginianus*. August 12, I collected one Baird's Sandpiper, *Tringa bairdii*, and another on August 18. This bird is mentioned as being rare in Ontario, but it has been common about Toronto this fall. August 15, Solitary Sandpiper, *Totanus solitarius*. August 23, White-rumped Sandpiper, *Tringa fuscicollis*. September 22, Black-throated Green Warbler, *Dendroica virens*. September 23, Black-poll Warbler, *Dendroica striata*. September 27, Northern Phalarope, *Phalaropus lobatus*. September 28, Whip-poor-will, *Antrostomus vociferus*. October 4, Buff-breasted Sandpiper, *Tryngites subruficollis*. October 6, Short-eared Owl, *Asio accipitrinus*. October 10, Hairy Woodpecker, *Dryobates villosus*. October 21, Snow-flakes, *Plectrophenax nivalis*, first of the season seen on Ashbridge's Bar. October 22, one Snowy Owl, *Nyctea nyctea*, Golden Plover, *Charadrius dominicus*. October 26, Winter Wren, *Troglodytes hiemalis*. November 16, Tree Sparrows, *Spizella monticola*, very plentiful on the Bar. September 27, Spotted Sandpiper, *Actitis macularia*.—JOHN EDMONDS.

Buteo swainsoni.—On May 3, a male Swainson's Hawk was captured in Rosedale. This is an exceedingly rare capture for this vicinity.

Pandion haliaëtus carolinensis.—On Sept. 15, a male Osprey was shot on the Don Flats and brought to me.

Urinator lumme.—A Red-throated Loon was shot at Green River east of Toronto, on Oct. 4. It was a full plumaged male bird.

Buteo borealis.—On Oct. 30, a female Red-tailed Hawk was sent me from Green River.

Nyctala acadica.—On Nov. 6th, I secured a Saw-whet Owl, one Barred Owl, *Syrnium nebulosum*, and one Long-eared Owl in Ashbridge's Woods. On the same day a partly albino Robin, *Merula migratoria*, was secured in Rosedale. It was a most peculiar bird being much larger than any I ever handled. The following are the measurements:—length, 10 inches; wing, 5⅜ inches. The back was very dark and the head entirely white.

Plectrophenax nivalis.—On Dec. 6, I shot one snowbird and two Goldfinches, *Spinus tristis*, in Rosedale.—D. G. COX.

Larus glaucus.—A Glaucous Gull was shot off the Queen's Wharf on Dec. 8th, and brought to me.

Somateria dresseri.—A Common Eider was shot off Toronto Island

on Dec. 6. On the same date a Cooper's Hawk, *Accipiter cooperii*, was shot on Davenport Road near High Park, where it had previously killed a hen.

Lanius borealis.—On Dec. 13, a Northern Shrike was brought in from North Toronto.—W. CROSS.

On the forenoon of Sunday Nov. 30, 1890, I heard a flock of crows making a loud outcry among a clump of evergreens in St. James cemetery, and thinking they had an owl in chase, I was making my way towards them when they took flight up the Don Flats and rested among dense evergreens. In this flight they passed so close that I had no difficulty in determining the object of pursuit to be a Red-tailed Hawk. The crows—as is always the case with them—were very eager in the pursuit, clamoring loudly, laboriously flapping upwards, and then shooting downward in graceful curves quite close to the hawk, whose only care seemed to be to elude the "brawling brood" of annoying screamers. Again the hawk darted off towards the evergreens on the Castle Frank heights, and rested as before in a dense mass of foliage, closely pursued by the crows. These short flights were repeated several times until the Rosedale heights were reached. The hawk, perhaps hungry, and knowing of the whereabouts of breakfast, seemed unwilling to leave the ground, but by this time the crows were largely reinforced, numbering over thirty, and their deafening outcry was quite unsupportable. After the lapse of a few minutes the hawk again darted off southward, doubling on his former course, closely followed by a crowd as eager, noisy and eldritch as Tam o' Shanter's witches. When immediately above the drive in the Rosedale ravine, being at an elevation of about 100 yards, he suddenly swooped downwards at almost a right angle to his course with astonishing velocity, to within a few yards of the ground. then executing a short and rapid curve he darted up the ravine, and in a few minutes he was soaring above the trees and his outmanoeuvred and now rapidly dispersing foes. It was one of the greatest and neatest feats of bird flight I ever saw executed. The velocity was greater than that of a falling body, words fail to convey an adequate idea of the suddenness and magnitude of the lunge.—DR. W. BRODIE.

(Thirty-seventh Meeting, December 23, 1890.)

Lanius borealis.—On December 17, I secured a Northern Shrike on Ashbridge's Bar, also one Song Sparrow, *Melospiza fasciata*, and one Tree Sparrow, *Spizella monticola*, at the same place.—W. METCALFE.

Junco hyemalis wintering.—On December 12, on Well's Hill, I saw a large flock of Juncos. It was a mild warm day. I passed the same place on December 8, but saw no birds, as the weather was cold and frosty.—G. E. ATKINSON.

(Thirty-eighth Meeting, January 13th, 1891.)

Lanius borealis. Syrnium nebulosum.—On December 25, I saw a Northern Shrike on Well's Hill, and on January 4, I saw a Barred Owl in the ravine at the same place.—E. DEACON.

Loxia curvirostra minor.—On December 25, I secured a male Crossbill on Well's Hill, which I believe is the first record of the season. On January 5, I saw a Screech Owl, *Megascops asio*, on the wires in front of the post office.—F. TWEED.

Bubo virginianus.—On December 29, I saw a flock of crows chasing a Great Horned Owl on the Don Flats, and I followed it for a long distance but could not get a shot at it. On January 9, I secured a Northern Shrike, *Lanius borealis*, on Gerrard St. East. It had been eating a mouse.—W. METCALFE.

Molothrus ater and Agelaius phœniceus.—On December 25, a Cow Bird and a Red-wing Blackbird were shot north of Toronto out of a small flock of Cow Birds.

Scotiaptex cinerea.—The first and only specimen of the Great Gray Owl was received from north of Toronto on January 13.—W. CROSS.

Habits of Native Birds in Captivity.—One of the chief aims of a Naturalist is to collect original information, and I don't think there is a better way of doing original work than by having living specimens to study from, in as near their natural condition as possible. To do this requires considerable time and trouble, but in the end you are satisfied, and fully repaid for your work. In dealing with birds some of the principal points to be noticed are, (1) Which birds agree; few would think of putting a Canary in a cage with an Owl. (2) To know what food these birds will live on and thrive, for instance Meadowlarks, Highholders, Robins and Bluebirds will not thrive on sunflower seed as Grosbeaks do, or Grosbeaks will not thrive on small seeds as the Sparrows do. (3) To study the habits of any bird thoroughly I find that (1) there should be regularity in everything, feeding, and cleaning cages, even heat, no draughts; birds can stand a great deal of cold but the hardiest will not

last long in a draught, (2) kindness and attention ; they should not be frightened or caught, and if a little cautiousness is exercised your birds will soon know you and will not be at all alarmed when you are near.

Bubo virginianus, *Great Horned Owl.*—This specimen came into my possession in infancy and although handled frequently gradually became of uncertain temper and objected to such intimacy. However he still shows some affection for his owner, and when hungry screeches if I appear within sight, until satisfied. He has a very peculiar appetite, sometimes being content with fresh meat, or living birds and mice, and sometimes he will leave the meat in a corner of the cage until in a putrid condition and then eat heartily of it. When he was about four months old he would take seven birds as big as sparrows at one meal. He will eat almost anything from a piece of fresh beef to a handful of cotton batting ; if a mouse or small bird be given him he seizes it by the head crushes the skull, and with two or three jerks it is swallowed, feathers, fur and all; after digestion he throws up the feathers or fur with the bones and hard portions rolled up into a ball. Birds the size of a Sapsucker are swallowed whole, but large birds or animals are torn to pieces with the beak and claws. He will take a bath about twice a week in warm weather but not at all in winter; from November till about May, he hoots nearly all night and part of the day, but the remainder of the year only makes a sharp screech. He shows great aversion to a dog, cat or rabbit and whenever any of them come near the cage he lowers his head, throws back his horns, curves his wings, and spreading his tail will raise all his feathers to their full extent and walk about snapping his beak and hissing most ferociously ; should the animal come near the cage he will bound against the bars at it and, as a rule, the intruder, taken by surprise, will depart hastily. When a snake is brought near him the tables are turned, he will then fly to the farthest corner of the cage and remain as quiet as possible, watching it until it disappears. If I am working near his cage at night he will amuse himself by throwing sticks and pieces of rag about and pouncing on them suddenly.

Colaptes auratus. — Flicker or Highholder. These birds being naturally of a shy disposition are very difficult to keep in a cage, as they dash themselves against the bars until exhausted. In confinement they will feed on corn or meat, but seem to get no nourishment from anything, and soon pine and die, if not liberated.

Otocoris alpestris praticola.—The Shorelark is a timid little creature, and although it takes readily to a cage and feeds well, it is constantly alert as if expecting to be taken by surprise, and at the slightest alarm it rushes to a corner, and conceals itself from view. It

feeds on small seeds, wheat, and occasionally a worm. Occasionally on a bright day I have found it running from one end of the cage to the other, flipping its wings, and chirping as if in the height of enjoyment. It sometimes sings in confinement, and always has a faint chirp which it keeps up all night. I have frequently found it with its head under its wing, chirping about once a minute.

Corvus americana.—Crow. Of all the birds kept by myself, and friends, the crow takes the lead for mischief. To tell of all the antics of this bird would fill a volume; so I will just give a few of his principal traits. He will not be contented in a cage, but must have the yard, shed, fences, and sometimes the kitchen, where he wanders about seeking what he may steal. My Crow when I fed him would eat what he required, and put the remainder through a hole in the fence to a dog in the next yard. At last the dog got to bark for his meat, but the Crow fixed him; he would put the meat up to the hole, and as soon as the dog put his nose there he received a ferocious dig from the big black beak that sent him away howling, only to return in a few minutes for another. When he was not fed regularly he would perch on my fish-tank, and watch till a fish came near the top, when he would immediately seize and swallow it. In that way he ran down my stock of fish considerably before I discovered the cause; and when I put a net over the tank he got on it, and tried with might and main to dig a hole through it, but did not succeed.

Molothrus ater.—The Cowbird takes readily to a cage, becoming quiet and contented in about a week, but is very unsociable. Should any other bird approach him he snaps at it viciously, generally depriving it of some feathers; he accompanies every snap with a kind of "chuck" and if victorious hops to his mate and tries to express his love for her with a spluttering "cree." They eat any kind of seed in confinement and when let out in the yard devour any insects they come across.

Sternella magna.—Meadowlark. This bird when first caged will starve itself until almost able to squeeze through the bars, but eventually resigns itself and takes to feeding. On the slightest excitement it dashes against the wires in great alarm and finding escape impossible generally hides in a corner. When walking it stands up very straight, the back being almost at right angle with the ground. At every step he opens and closes the tail shewing the white feather at every spread. While in my possession he killed and partly eat a Shorelark, a White-throated Sparrow, and badly injured a Pine Grosbeak.

Coccothraustes vespertina.—The Evening Grosbeak takes readily to the cage but does not associate with any of the inmates. Generally be-

ing contented with their own company, they will sit quietly in the cage for sometimes a whole day, and again they are on the jump the whole time and keep up a kind of wrangling noise among themselves. This and the loud call something similar to that of the Great-crested Fly-catcher, are the only sounds they make. They are very destructive to the smaller inhabitants of the aviary which may incur their displeasure and come within the reach of their powerful beaks. When fighting among themselves they use their beaks as a sort of shield receiving the blows of their opponent thereon. In confinement they eat ravenously of almost any seed, but are partial to sunflower and hemp. With a few slight variations in the olive green markings of the male, the plumage is the same all the year.

Pinicola enucleator.—The Pine Grosbeaks are of a gentle disposition, and never interfere with other birds, but seem to enjoy their company, and are as contented in a cage as in a tree after the first day. My male bird would watch for my coming to feed him, and would hop out on my hand on to my shoulder, and down into the yard where he would hunt worms for a while and always went back to the cage door to get in. If I did not let him out, he would mount to the highest perch and solace himself with a song, which is very sweet but muffled. They are, however, very hard to keep in hot weather; no matter how cool the cage may be, they seem to take a kind of decline and do not last long. In the summer and fall the red of the male turns to yellow and he looks like a new species, with the red and yellow feathers mingling together. They eat almost any kind of seed, but are partial to sunflower, hemp and buckwheat. They will also eat berries or fruit of any kind, or a piece of meat or worm.

Carpodacus purpureus.—The Purple Finch is tolerably well known as a cage bird, and seems as contented in a cage as in the bush; the specimen which I kept was better contented in the cage than in a room. They are very clumsy birds when let loose, and will fly against a pane of glass or a wall, and falling to the floor remain there till picked up and put in the cage, where they soon begin to arrange their feathers. The male has a very beautiful song, and sings almost as well in a large cage as in his native haunts; they are very fond of sunflower and hemp seed, but will eat almost anything given them in the shape of berries; occasionally they take a grub or worm.

Acanthis linaria.—The gay little Redpoll is also well known as a cage bird, and is quite happy in a small cage, but does not seem to get along well in company with other birds; they seem to be continually eating, yet never seem to put on flesh, generally being very thin and poor when dead.

Spinus tristis.—The American Goldfinch is certainly the most interesting and handsomest bird I have ever kept, displaying a good deal of affection and being always lively. They are, however, hard to keep in the fall, being subject to the same decline as the Redpoll; both the spring and fall changes in plumage take place by moulting. They will feed on almost any seed, but are partial to sunflower and hemp, and will occasionally catch flies and beetles.

Zonotrichia leucophrys.—White-crowned Sparrow. The Sparrows as a class are almost alike in their feeding habits, and if one species is secured and watched there is no difficulty in relating the habits of nearly every species. They spend their time on the ground, and are constantly scratching. Of course as regards sociableness, there is considerable difference between some of them. The White-crowned are, however, very quiet inoffensive birds among other species: how they may be with their own species I have yet to learn. They feed on the ground, on the seed thrown out of the box by the others. I secured one specimen of this bird in the beginning of October, and had him about three weeks, when he was killed by the female Evening Grosbeak.

Zonotrichia albicollis.—White Throated Sparrow. This species lives well in confinement, and often utters his peculiar song, especially after gaining a victory over some of the other birds in the aviary; they seem to regard it as their especial mission to harass and annoy the other birds, and after a successful combat the male will mount to the topmost perch, and with wings and tail drooped and beak pointing upwards, will pour out his mournful "Old Tom Peabody," as if it was to be the last sound he would ever utter. In a cage they spend a large portion of their time on the ground, scratching over the loose seed.

Junco hyemalis.—In some respects the Juncos' habits are the same as the Sparrows', being often on the ground; they are more sociable and very timid, seldom showing themselves while they are watched, and on the slightest disturbance they hide in a corner or against the tree, and will not show themselves till everything is quiet, when they will hop out suddenly and chirp away as pleasantly as if they were in the bush. On a bright warm day they mount about half way up the tree and sing out their little ditty, which seems to put new life into the dullness of the aviary and generally starts all the other birds singing. They eat very little, and keep in good condition on the seed thrown about the ground by the Sparrows.

Melospiza fasciata.—The Song Sparrow has the same habits as the majority of sparrows but is rather more sociable and has some of the

hiding nature of the Junco. They feed the same as the Junco, and have a great partiality for worms and caterpillars.

Melospiza georgiana.—The Swamp Sparrow has precisely the same habits as the Song Sparrow with a greater fondness for the water; after taking a good bath and getting thoroughly soaked it will roll in the sand; it feeds the same as the Song Sparrow and will eat worms, caterpillars, grasshoppers, and berries.

Passerella iliaca.—The Fox Sparrow is the largest and handsomest of the Sparrows I have ever kept, they are of a sociable disposition and their habits and food the same as the other Sparrows.

Pipilo erythrophthalmus.—The Towhee is a most interesting bird, very tame and quiet, but very hard to keep long, sensitive to cold and draughts; they are of a playful nature, and will play with anything they find in the cage such as string, etc. They spend all their time on the ground searching for seed and have a great partiality for hemp and sunflower seed.

Cardinalis cardinalis.—The Cardinal is much like the Towhee in habits but not quite so familiar with the other birds that seem to hold him in a kind of reverence; they very seldom molest him and are glad to get away when he is disturbed. It is very sensitive to cold and draught and spends most of its time on the ground. They eat sunflower, hemp, buckwheat and mountain ash berries.

Regulus satrapa.—Golden-crown Kinglet. These minute and beautiful little birds may be kept for a while in a cage and fed on small seeds, but will not thrive unless they have insect food. They are very tame but not cowardly and will attack any bird that comes near them.

Sialia sialis.—The Bluebirds can be kept in a cage, but not with success; they can be fed on hemp seed and Mocking Bird food, with an occasional worm; they will become very tame and feed from the hand, but seem to always pine for liberty, and if not released soon die.

Passer domesticus.—For four years I have kept English Sparrows in confinement and though they are credited with doing great damage to grain crops, my birds would never touch wheat, oats, corn, or peas; they would prefer crumbs of bread or a crust to seed at any time, and never kept healthy when fed on seed alone. This summer I caught several young Sparrows and put them in a cage in the yard to be fed by the old birds, which laboured from morning till night bringing caterpillars and grasshoppers from a neighbouring garden to feed them, and I have watched the old birds on the berry bushes picking off the caterpillars and other insects but leaving the berries untouched.—GEO. E. ATKINSON.

(Fortieth Meeting, February 10, 1891.)

Merula migratoria.—February 1, I saw four Robins in the University Grounds.

Cyanocitta cristata.—February 5, observed a number of Bluejays in the University Grounds.—GEO. E. ATKINSON.

Ardea herodias.—On February 1, as I was walking along the Esplanade, I saw a Great Blue Heron, flying over the Bay, and afterwards learned that the bird had been about for several days.—JAMES H. AMES.

Otocoris alpestris praticola.—February 8, observed a pair of Shorelarks in the fields north of the city, one of them flew up, and lit on a telegraph wire.—ED. DEACON.

Larus glaucus.—On February 7, I saw a fine Glaucous Gull, flying over the bay.—WM. CROSS.

(Forty-first Meeting, February 24, 1891.)

The following list of birds are given as occurring in the vicinity of Orillia:

Ampelis cedrorum.—A pair of Cedar waxwings were observed here, from December 1890, to January 1891, feeding on berries of Mountain Ash.

Calcarius lapponicus.—A flock of Lapland Longspurs, observed at Gravenhurst, April 29, 1890.

Quiscalus quiscula.—Crow Blackbird, an albino specimen collected at Gravenhurst.

Junco hyemalis.—An albino Junco, collected August, 1890.

Corvus corax sinuatus.—A fine specimen of the Raven, collected December, 1890.

Dendragapus canadensis.—A Canada Grouse, collected December 15, 1890.

Haliæetus leucocephalus.—Bald Eagle, a specimen collected at Waubaushene, November 12, 1890.—W. MELVILLE, Orillia.

Spinus tristis.—On February 21, I collected a pair of American

Goldfinches from a flock of four, the male had begun to acquire the yellow plumage.—J. A. VARLEY.

Ampelis cedrorum.—On February 22, I saw several Cedar Waxwings, in the Queen's Park.—HUBERT H. BROWN.

Lanius borealis.—Observed a specimen of the Northern Shrike, at Georgetown, also Crows feeding on seeds of Sumach.—W. METCALFE.

(Forty-first Meeting, February 24, 1891).

Nesting of the Winter Wren (*Troglodytes hiemalis*).—As I usually do in the early part of May, I took a ramble to some woods southwards of the town, where I saw some newly made nests of this species, in their usual nesting places, *i.e.*, the roots of newly-fallen trees, from which I hoped to secure some sets of eggs, but revisiting them on the 24th of May, I was returning disappointed, when I concluded to make a short nest-hunting ramble, in a piece of scattered wood to the right of my way. Near the western outskirt of this tract, the newly turned up root of a medium sized hemlock tree caught my notice, and to it I directed my steps. This tree in its fall had caught on another stub, so that its top was still high off the ground, and the upper part of the "root" slanted like the roof of a hut, the top of which would be about seven feet from the ground; and under this was a well-sheltered nook. Looking into this natural wigwam, the nest of a Winter Wren at once caught my eye, for it was directly in front, and towards the top of the roof, and some of the vegetable fibres used in its construction hung downwards; altogether it was less compactly formed, and more exposed to view than the nests of this species generally are, and more grass and other vegetable fibres and small brambles were employed in the formation of this particular nest, than this bird usually makes use of. The greater part, however, of this ball-shaped structure was composed of the common moss that grows on old logs, and the sides of certain trees in low places, while the inside was lined with fine dry grass, some small feathers and a little hair from the tails of cattle or horses; around the entrance were variously arranged the dry stems of hemlock leaves, a species of material always used by this bird for this purpose, when it can procure them in the vicinity of its nesting place. The entrance into this nest, as indeed the whole structure, was so much like that made by a mouse, that a person not acquainted with the subject, might easily mistake it for a nest of that little animal.

When removed from its site in the mould, and rootlets of the "turn up," I found that the outside circumference was about fourteen inches, inside it would be about eight. The door was near the top in the outer side, leaving a soft and warm cavity of about two inches deep for the reception of the eggs and the cradle of the young. I did not at this time see or hear either of the parent Wrens, near the nest, but when I next visited the place, the songs of the male bird fairly made the echoes ring in the vicinity. There was, however, no mistaking the sound as that of the Winter or Wood Wren, for there is no other Canadian bird that makes a nest in any way resembling it, though the eggs are very like those of the Chickadee and Brown Creeper. From what I could see of the inside of this nest when discovered, I inferred that it was finished, and probably occupied, and I was not disappointed, for on inserting a finger, I found that it contained five eggs, and perfectly fresh, the color almost pure white, with a few reddish dots towards the larger end, being less spotted than others that I had seen, and before the contents were extracted they had a pinkish hue. Some five or six other newly made nests of this species were observed in this vicinity the past season, but none of them contained eggs or had inner lining, and I am led to conclude that they were the work of male birds. All of these were in the roots of fallen trees, and well concealed, and the female must have had her true nest near by, as the songs of the males were heard throughout the season. This was the fourth nest with eggs found in this vicinity in a period of fourteen years.—WM. L. KELLS, Listowel.

(Forty-Second Meeting, March 11, 1891.)

Perisoreus canadensis. Picoides arcticus. Dryobates villosus leucomelas. Nyctala acadica.—On February 24, received a pair of each of these species from Bardsville, Muskoka.—W. CROSS.

Loxia curvirostra minor.—February 25, saw a small flock, feeding on Mountain Ash berries, on College Street, Toronto.—E. DEACON.

Spinus tristis.—February 26. A flock of twenty are feeding on crumbs at my back-door, the first I have seen this season.

Acanthis linaria.—I have neither seen nor heard one this winter. February 21.

Corvus americana.—Occasional during this winter, 1891.—A. KAY, Port Sidney, (is about 150 miles north of Toronto.—EDITORS.)

(Forty-third Meeting, March 24, 1891.)

Sialia sialis.—March 21, a small flock north of Rosedale. An early arrival.

Otocoris alpestris praticola.—March 2, very numerous in bare fields north of Toronto.—H. H. BROWN.

Sialia sialis.—March 22. Saw a flock high up in the air, flying to the west, also on March 23, two flocks flying to the north east, these are early arrivals.

Carpodacus purpureus.—March 23, collected a fine specimen in University Park.

Merula migratoria.—March 23, common in University Park.—G. ATKINSON.

Sialia sialis.—March 17, saw a pair within city limits.

Merula migratoria.—March 23, on the roof of a house, Queen Street east, Toronto.

Junco hyemalis.—March 23, saw a flock in Rosedale in full song.

Merula migratoria.—March 24, collected a specimen on Don Flats.

Dryobates pubescens.—March 24, collected a male specimen on Don Flats.

Sialia sialis.—March 24, common everywhere on Don Flats.—W. METCALFE.

Sturnella magna.—March 20, collected near Toronto, handed to me for mounting.

Bubo virginianus.—March 20, a fine specimen collected near Toronto and handed to me for mounting.—J. R. THURSTON.

(Forty-fourth Meeting, April 14, 1891.)

Sialia sialis.—March 25, collected two males on Well's Hill.

Certhia familiaris americana.—March 27, at Port Credit, fourteen miles west of Toronto, none were seen in the morning, but in the afternoon they were numerous, collected first specimen of the season.

Corvus americana.—March 29, building in University Park.

Sturnella magna.—March 30, first seen.

Agelaius phœniceus.—April 1, first seen.

Quiscalus quiscula æneus. - April 1, first seen.

Molothrus ater.—April 2, arrived.

Junco hyemalis.—April 2, migrating northwards.

Melospiza fasciata.—April 2, arriving in large numbers.

Spizella monticola.—April 2, arriving, numerous.

Sialia sialis.—April 2, numerous all day, flying slowly eastwards.

Passerella iliaca.—April 5, several on Well's Hill.

Sayornis phœbe.—April 5, collected one specimen on Well's Hill.

Haliæetus leucocephalus.—April 5, saw one specimen flying northwards.

Poocætes gramineus.—April 9, arrived. Secured first specimen of the season.

Regulus satrapa.—April 10, first seen in Park.

Colaptes auratus.—April 10, first seen.

Sphyrapicus varius.—April 11, first of season.

Passerella iliaca.—April 11, several on Well's Hill.

Turdus aonalaschkæ pallasii.—April 11, collected specimen in Park.

Pipilo erythrophthalmus.—April 13, first seen.

Loxia leucoptera.—April 13, collected male.

Tachycineta bicolor.—April 13, first seen.

Regulus satrapa.—April 13, saw a large number in University Park ravine, hopping and flitting about on the grass. They would rise about six feet in the air, fly about ten feet forwards and drop on the grass. They resembled butterflies flitting in the sun. It was a very beautiful sight.

Ectopistes migratorius.—April 13, saw a male specimen in University Park ravine, which I pursued for half an hour but failed to collect.

Troglodytes hiemalis.—April 14, first seen in University Park.

Zonotrichia albicollis.—April 14, collected specimens in University Park.

Regulus calendula.—April 14, collected specimens in University Park.

Passerella iliaca.—April 14, numerous in University Park Ravine.—G. ATKINSON.

Merula migratoria. Melospiza fasciata.—March 27, collected specimens on Well's Hill.

Sialia sialis. Passerella iliaca.—April 5, on Well's Hill.

Melospiza fasciata. Spizella monticola. Sayornis phœbe. Molothrus ater.—April 6, on Well's Hill.

Sitta canadensis.—April 6, on Well's Hill, the first seen since Christmas, 1890.

Haliæetus leucocephalus.—April 6, flying eastward.

Quiscalus quiscula æneus. Sturnella magna. Passerella iliaca.—April 6, collected specimens on Well's Hill.

Merula migratoria. Sialia sialis. Melospiza fasciata.—April 7, collected specimens on Well's Hill.

Junco hyemalis. Molothrus ater. Loxia curvirostra minor.—April 8, collected on Well's Hill.

Poocætes gramineus.—April 9, numerous specimens came this morning.

Pica pica hudsonica.—April 9. This morning I saw three birds flying northwards, which might have been of this species. They were less than Crows, their bodies were black, and wings white. They were flying with a small flock of Crows.

Dendroica coronata.—April 13, numerous specimens arrived this morning.

Loxia curvirostra minor. Sayornis phœbe. Passerella iliaca. Regulus satrapa.—April 13, collected on Well's Hill.—F. TWEED.

Melospiza fasciata.—March 25, 9 a.m., a fine clear morning, bright sunshine, temperature about 40°, light wind from the North-east; saw and heard nine Song Sparrows, along Don improvement and in Eastern Park, on an area of about three acres. They appeared to be quite numerous feeding among masses of *chenopodium*, *polygonum*, and *solidago* of last year's growth.

During the night of the 24th, the temperature fell to 29° with a strong north-easterly wind, ice formed a quarter of an inch thick. As the Sparrows were not here on the 24th and as it is not likely they would cross the Lake in such a cold night, in face of a brisk wind, they most probably were resting during the night of the 24th among the Typhas and semi-aquatic vegetation of Toronto Marsh, and took the first opportunity of moving northwards on the warm morning of the 25th. The morning of the 26th was clear and warm but only one Song Sparrow was heard.

The afternoon of the 29th, was bright and warm, numerous specimens of Diptera, also *Aphodius fimetarius* and *Vanissa antiopa*, were observed. ravines east of the city limits, several Song Sparrows were heard and seen.—W. BRODIE.

Melospiza fasciata.—April 13, a bright warm forenoon, grassy fields beginning to look green, patches of ice and snow still lying in sheltered places. *Bufo lentiginosus* heard for the first time this season. Song Sparrows beginning to pair, apparently resident, numerous, singing.

Sialia sialis.—April 13, saw three pairs; they were looking for nesting places.

Merula migratoria.—April 13, saw one pair preparing to nest, heard several singing.

Corvus americana.—April 13, all paired and nesting.—W. BRODIE.

Melospiza fasciata. Merula migratoria.—March 29, abundant in Rosedale Wood.

Quiscalus quiscula æneus.—April 1, a small flock in a clump of pines on Bloor St. all day, but left during the night.

Philohela minor.—April 2, a male specimen in splendid spring plumage was received at the store. It had been killed by flying against the telegraph wires on College St. during the night.

Sayornis phœbe. Sialia sialis.—April 4, numerous specimens.

Molothrus ater. Quiscalus quiscula æneus. Melospiza fasciata. April 5, common in and around city.

Junco hyemalis. Regulus satrapa.—April 12, saw a flock of these two in company.

Troglodytes hiemalis.—April 12, a few specimens seen.

Sturnella magna. Colaptes auratus.—April 13, numerous specimens seen.

Spinus tristis.—April 13, observed a large flock in breeding plumage, the first seen since February 12.—E. DEACON.

(Forty-fifth Meeting, April 28th, 1891).

Spizella monticola.—April 17, common up to date, but this morning I could neither see nor hear any.

Poocætes gramineus.—April 17, this species seems to have taken the place of the Tree Sparrows.

Harporhynchus rufus.—April 21, several males seen in Rosedale woods in full song.

Spizella pusilla.—April 21, the first of the season, numerous, in full song.—E. DEACON.

Quiscalus quiscula æneus. Poocætes gramineus.—March 27, observed several specimens.

Fulica americana. Botaurus lentiginosus.—April 11, observed in Toronto marsh.

Ammodramus sandwichensis savanna.—April 26, collected on sand bar, Ashbridge's Bay.—J. EDMONDS.

Ceryle alcyon.—April 19, observed at Victoria Park.

Spizella pusilla.—April 16, observed a flock in Rosedale woods.

Fulica americana. Progne subis.—April 19, collected in Ashbridge's Bay.

Harporhynchus rufus.—April 26, common in Ashbridge's Bush.

Corvus americanus.—April 26, a nest found containing four eggs.—J. L. JACKSON.

Otocoris alpestris praticola.—March 11, collected a female specimen in full breeding plumage.

Agelaius phœniceus.—March 29, observed a flock flying over sandbar, and marsh at Kew. They seemed very uneasy, and unwilling to alight; collected specimens.

Melospiza fasciata.—March 29 and 30, arrival of great numbers of Song Sparrows. Height of spring migration. I collected specimens, the plumage seemed darker than that of specimens arriving later.

Sturnella magna.—March 30, collected specimens at Kew.

Quiscalus quiscula æneus.—April 2, observed a pair near the Woodbine.

Lanius borealis. Dryobates pubescens.—April 9, collected specimens at Kew.

Sayornis phœbe. Certhia familiaris americana. Junco hyemalis.—April 12, numerous specimens observed at Kew.

Urinator imber.—April 20, a pair observed out in the lake, opposite Kew.

Poocætes gramineus. Sayornis phœbe. Sialia sialis.—April 13, collected specimens at Kew, the Vesper Sparrows were very numerous.

Spizella monticola. Sturnella magna. Molothrus ater.—Collected specimens at Kew, April 15.

Ceryle alcyon.—April 17, a pair observed at Kew.

Ceryle alcyon. Passerella iliaca. Sialia sialis. Junco hyemalis. Colaptes auratus.—April 8, collected specimens at Kew. The Fox Sparrow was in company of a pair of Song Sparrows one of which was endeavouring to drive it away.

Regulus calendula. Dendroica coronata.—April 20, collected specimens at Kew.

Colaptes auratus. Melospiza georgiana.—April 25, collected specimens at Kew.—J. A. VARLEY.

Passerella iliaca. Turdus aonalaschkæ pallasii. Sphyrapicus varius and **Ceryle alcyon.**—Arrived on April 15.

Passerella iliaca.—Fox Sparrows appeared in large numbers on April 16, and had almost entirely disappeared by April 20.

Colaptes auratus. Spizella socialis.—Noticed on April 15.

Zonotrichia albicollis. Spinus tristis, Molothrus ater.—Observed on April 18.

Poocætes gramineus.—Arrived on April 20.

Tachycineta bicolor.—A Tree Swallow was seen on April 21.

Carpodacus purpureus.—I observed on April 25 a Purple Finch.—FRANK TWEED.

Passerella iliaca.—On April 15, I saw a Fox Sparrow, in company with a small flock of Juncos *(Junco hyemalis).*

Spizella socialis.—April 15, I saw a Chipping Sparrow.

Tachycineta bicolor. Ceryle alcyon.—I first saw Tree Swallows on April 17, and on the same date saw a Kingfisher.—WM. METCALFE.

Nyctea nyctea.—A male Snowy Owl was shot at Bolton on April 16. The bars on the plumage were very brown.

Botaurus lentiginosus.—On April 21, an American Bittern was shot on the Humber.—JAS. R. THURSTON.

Clivicola riparia.—I note the arrival of Bank Swallows on April 19.

Carpodacus purpureus, etc.—On April 20, I saw Purple Finches and Prairie Horned Larks *(Otocoris alpestris praticola).*

Melospiza georgiana.—I first saw Swamp Sparrow on April 20.

Sturnella magna, etc.—Meadow Larks were quite common on April 25, but were very wild. On April 23, a flock of Wild Geese was seen by Mr. Herbert Petman, flying in a north-easterly direction over the bay.—J. B. WILLIAMS.

Turdus fuscescens. Chætura pelagica.—On April 19, I heard the Wilson's Thrush for the first time, and on April 18, Mr. F. Cockburn observed Chimney Swifts.

Antrostomus vociferus. Spizella pusilla.—On April 25, Whip-poor-wills and Field Sparrows had arrived.

Chelidon erythrogaster. Progne subis.—I saw a Barn Swallow and a Purple Martin on April 25.

Mniotilta varia.—Black and White Creepers around on April 27.

Harporhynchus rufus.—Arrived on April 28.—GEO. E. ATKINSON.

(Forty-sixth Meeting, May 12th, 1891).

Philohela minor.—On April 29, I saw an American Woodcock at North Toronto.

Chordeiles virginianus. Helminthophila ruficapilla.—I saw for the first time this season Night Hawks and Nashville Warblers, on May 1.

Dendroica cærulescens. D. virens.—May 6, Black-throated Blue Warblers arrived. May 8, Black-throated Green Warblers arrived.

Icterus galbula and **Zonotrichia leucophrys** arrived on May 9, at Toronto.

Melanerpes erythrocephalus.—Red-headed Woodpecker seen on May 10.

Dendroica maculosa.—May 12, I saw Magnolia Warblers.—FRANK TWEED.

Compsothlypis americana.—On May 12, I observed a Parula Warbler in Rosedale, Toronto.

Dendroica blackburniæ.—Saw a Blackburnian Warbler in Rosedale on May 12.—W. METCALFE.

Habia ludoviciana.—I shot two Rose-breasted Grosbeaks on the Don, on May 9.

Antrostomus vociferus.—On May 10, I shot a Whip-poor-will.

Dendroica pensylvanica.—Seen on May 10.—J. B. WILLIAMS.

Icterus galbula and **Dendroica æstiva.**—I heard two Baltimore Orioles, and several Summer Warblers on May 10, in north part of city. —HUBERT H. BROWN.

Sturnella magna, nesting.—On May 2, a nest of this species was brought to me with three eggs found just north of the city.

Merula migratoria, nesting.—On May 3, I found a Robin's nest containing two eggs, in an elm tree. I think the situation was very unusual, the tree being bare; they usually build in evergreens when breeding early in the season. I also found several other nests later on.—GEO. E. ATKINSON.

Compsothlypis americana.—I saw a Parula Warbler in the city on April 30.

Galeoscoptes carolinensis arrived.—I saw a Catbird first on May 5.

Dendroica æstiva. Icterus galbula.—Yellow Warbler arrived May 6, and Baltimore Oriole on May 8.

Setophaga ruticilla.—Saw an American Redstart on May 12.—F. COCKBURN.

Trochilus colubris.—On May 10, I saw a Ruby-throated Hummingbird on the sandbar.

Cistothorus palustris. Melospiza georgiana.—I observed these in the marsh on April 14.—JOHN L. JACKSON.

Polioptila cærulea at Toronto.—I collected a female Blue-gray Gnatcatcher on May 5, on Well's Hill, North Toronto. This bird is a rare visitor in this locality.

Totanus melanoleucus.—On May 8, I shot a pair of Greater Yellowlegs on the sandbar.—O. SPANNER.

Ægialitis meloda at Toronto.—I collected a specimen of the Piping Plover on May 1, at sandbar, and I also procured a Gallinule, *Gallinula galeata.*

Anas discors.—On the same date large numbers of Bluewinged Teal were observed in company with Scaup Ducks.

Sterna tschegrava.—On May 7, I procured three fine specimens of the Caspian Tern, at Ashbridge's Bay, and on May 10, I observed several of this species on the Humber Bay.

Merganser americanus. Oidemia deglandi.—On May 11, I saw American Mergansers near Mimico, and also a pair of White-winged Scoters.—J. R. THURSTON.

(Forty-seventh Meeting, May 27, 1891.)

Zonotrichia leucophrys.—On May 16, I found quite a flock of White-crowned Sparrows in the Don Valley.

Passerina cyanea.—I saw an Indigo Bunting on May 23.

Sylvania canadensis. Spinus tristis.—Of the former I secured a male specimen, the latter were very numerous on May 23.

Dolichonyx oryzivorus.—I saw a Bobolink on May 25.

Piranga erythromelas, scarce.—There seems to be a scarcity of Scarlet Tanagers this year; their movements seem to be very erratic.—J. B. WILLIAMS.

Vireo olivaceus. Dolichonyx oryzivorus.—First seen on May 13.

Seiurus noveboracensis.—Arrived May 14.

Large migration of Zonotrichia leucophrys.—During the night of May 13th, the largest migration of White-crowned Sparrows on record took place at Toronto. On the morning of the fourteenth the city was swarming with them. They were to be seen in every yard, tree, shrub and street and their song seemed to be universal.

Their numbers increased till the fifteenth, and on the sixteenth there was a marked movement to the north, and they continued to diminish in numbers till the twenty-third when but one or two were to be seen.

While here they would mix with *Passer domesticus* and feed on horse manure, etc. This movement was remarkable as it appeared to be local, for Mr. Brown informs me that even in the near surrounding country and woods, there were very few to be seen, while in the city they were exceedingly abundant.

Vireo gilvus.—On May 16, I secured a Warbling Vireo in the University grounds.—GEO. E. ATKINSON.

Poocætes gramineus, nesting.—May 12, on Well's Hill, North Toronto, I found a Vesper Sparrow's nest with two eggs.

Dendroica maculosa. D. coronata.—I saw Magnolia Warblers on May 14, and Myrtle Warblers on May 18.

Myiarchus crinitus. Empidonax minimus.—Seen on May 14.—FRANK TWEED.

Piranga erythromelas.—I shot a female Scarlet Tanager at East Toronto on May 25. This is the only one of this species I have seen this season.

Vireo olivaceus.—Were unusually numerous at East Toronto on May 25.—HUBERT H. BROWN.

Ardea virescens at Toronto.—I saw a Green Heron on May 17,

in Toronto marsh, and on May 16, I shot a male *Piranga erythromelas*, at Kew Beach, Toronto.—J. A. VARLEY.

(Forty-eighth Meeting, June 9, 1891).

Zonotrichia albicollis.—On June 6, I came across a pair of White-throated Sparrows, whose actions suggested the proximity of their nest, but I failed to find it, so I shot both birds. Next day I visited the same place and heard another bird singing, and on approaching him, the female flew from a clump of bushes. I hunted thoroughly for a nest but could not find one, so I left the birds intending to watch them more closely another time.—EDWARD DEACON.

Bald-headed Eagles killing Deer.—In the spring of 1891, I had two specimens of the Bald-headed Eagle, *Haliæetus leucocephalus*, sent to me to be mounted, from Redwood, on Lake Joseph, Muskoka. On making enquiries, I learned that they were caught in the act of eating a Deer they had just killed. Mr. Lee, who owns them relates the circumstances as follows:

"The winter of 1890-1, I spent in company with a friend trapping in that section of country lying north-west of Lake Joseph. Returning one day from a visit to our traps, we were going round an arm of the lake when five eagles rose from the ice and flew out towards the lake. I was carrying a pack of skins and had my rifle strapped on my back, but my partner not being hampered, fired and killed the white-headed bird. We went to where they rose from, and found the remains of a doe fawn of about seventy-five pounds weight; the animal had ventured out on the ice, and being some distance from cover had fallen an easy prey to the flock of hungry birds. We went back on the tracks some distance, and not seeing the tracks of any other animal were quite sure that it was killed by the Eagles. We poisoned the carcass and returning next day found the young bird dead, close by. Two other cases of small Deer killed by Eagles had come under my notice the same winter, but I have never known them do so during my former residence in the country, and do not know of anybody who has had a like experience." The white-headed bird referred to was a mature specimen with pure white head and tail, and large yellow beak, the young bird was full sized, a large powerful bird, possibly over a year old, the bill horn coloured, and the head and tail washed and blotched with a dirty greyish white, the markings from the head extending some distance down the middle of the back below the usual termination of the neck marking.

Mr. Lee was of the opinion that all five birds were of the same family, *i.e.* two old birds and three youngones.—JAMES R. THURSTON.

REPORT OF THE OCCURRENCE OF THE EVENING GROSBEAK, (*COCCOTHRAUSTES VESPERTINA*), IN ONTARIO DURING THE WINTER OF 1889-90.

Being a summary of recorded observations of the occurrence of this bird at Toronto, and other localities in Ontario; also notes on the occurrence and habits of the bird in the Province of Manitoba, collected and arranged by the Ornithological Sub-section of the Canadian Institute.

January 11, Mr. C. H. Baird, of Paris, Ont., has informed me that a large flock of Grosbeaks were in that vicinity for some days at this date, none were collected.—J. EDMONDS.

January 16, one female specimen collected from a flock of twenty observed near Lorne Park, about fourteen miles west of Toronto. The gizzard was distended with choke cherry and haw stones, crushed by the powerful beak of the bird.—E. E. THOMPSON.

January 18, observed a solitary specimen on Wilcox St., feeding on mountain ash berries, but failed to collect it.—G. E. ATKINSON.

January 18, while walking in Rosedale I observed a large flock of birds resting on some oak trees, and soon made them out to be Evening Grosbeaks. I made a double shot but was much disappointed to find my second shot had brought down an adult male Pine Grosbeak, however, on stepping under the tree I was pleased to find as the result of the first shot, my first Evening Grosbeak. Soon after I collected another male and two fine females.—W. CROSS.

January 19, saw a flock of eight Evening Grosbeaks resting on a tree by the G. T. R. track, East Toronto. On the afternoon of the same day I observed a flock flying over Winchester St., within city limits.

January 21, Messrs. Mitchell, Gray and Marsh collected twenty-four specimens, nine males and fifteen females, in Rosedale. I obtained six of them and found them all very fat. Their crops were full of unbroken pits of *Prunus serotina*, while their gizzards were crammed with the same broken, sharp sand, and a few fragments of a shell, probably a *Helix*.—D. G. COX.

January 21 to February 3, Evening Grosbeaks were common at the Highland Creek, about fourteen miles east of Toronto. None were observed at Claremont, ten miles to the north.—JAS. ANNIS.

January 22, I again visited the locality in Rosedale where I had found

them on the 18th, without finding any, but on going a little further on, I surprised two males feeding on the ground, but failed to collect them. Meeting a friend we went to where he had previously seen a large flock feeding on the ground. We soon came on them still feeding on the ground, and I secured several pairs in first rate condition.—W. CROSS.

January 22, I came on a flock of about fifteen Evening Grosbeaks in a field north of the city, and collected three specimens. They were feeding on the ground, on witch hazel, white oak and red hawthorn. On my way home I saw a pair on Jarvis St., feeding on berries of the mountain ash.—J. B. WILLIAMS.

January 24, I observed three Evening Grosbeaks in Rosedale, and watched them for some time. They fed on the ground, and their actions were much like those of the *Pipilo erythrophthalmus*. No doubt they were in search of fallen fruits and seeds. Two specimens secured this day had been feeding on the sprouted seeds of maple; their stomachs were excessively distended.—E. E. THOMPSON.

January 24, I saw two pairs of Evening Grosbeaks in the Normal School Grounds, feeding on mountain ash berries. They were very tame. —H. H. BROWN.

January 24, while walking in Rosedale to-day, I came on a flock of Evening Grosbeaks, and collected five fine specimens.—J. H. AMES.

January 25, at North Toronto I saw a flock, but could not collect any. Several collectors had been hunting them, and six or eight specimens had been procured. H. Parish saw two in the Normal School Grounds. —H. H. BROWN.

January 25, Mr. Powell secured three pairs in Rosedale. They had been feeding on seeds of white ash and on pits of mountain ash.—D. G. COX.

January 27, Mr. Ames and I saw a large flock in Rosedale, but did not collect any.—W. CROSS.

January 27, I noticed a flock of the same birds flying north over the C. P. R. track.—J. B. WILLIAMS.

February 1, I have not observed any Evening Grosbeaks about Claremont. I heard of their appearance east, west, and south of this point, and anxiously watched for them.—G. BRODIE, M.D.

February 1, I saw a flock of six or eight, at North Toronto.— H. H. BROWN.

February 1, I saw a flock of five north of Rosedale.—J. B. WILLIAMS.

February 1, I have looked for Evening Grosbeaks, but up to date have seen none in the neighborhood of Scarboro.—W. HORSEY.

February 2, saw one specimen at North Toronto.—H. H. BROWN.

February 8, saw large flock pass over my head. They passed and repassed several times during the day. I collected two specimens at corner of College and Spadina Avenue.—G. E. ATKINSON.

February 8th, saw three small flocks on Carlton St., feeding on mountain ash berries. In the afternoon I saw a flock of about thirty in the Don Valley, feeding on the seeds of the white ash. I watched their manner of feeding; some of the birds cut the seeds off allowing them to fall to the ground before eating them, others ate the seeds as they picked them. I collected four specimens, two males and two females. Their stomachs contained nothing but white ash seeds.—WM. METCALFE.

February 9th, I saw five males and four females in a mountain ash tree on College Street, there were also several feeding on the ground. I subsequently saw about fifty on Huron Street, they were nearly equally divided between Pine and Evening Grosbeaks, I shot a female. These birds were very tame, and I almost got near enough to knock them over with a walking stick. I think the recent fall of snow has driven them into the city in search of mountain ash berries, their favorite food, the black ash seeds being too far under the snow. The berries are eaten off nearly all the mountain ash trees.—H. H. BROWN.

February 9th, I collected three in the city.—GEO. E. ATKINSON.

February 9th, noticed a number of Grosbeaks in a mountain ash tree on Rose Avenue, some of them were red plumaged, *Pinicola enucleator*, while two were of the same species in female plumage, they were feeding on the berries. On the ground was a female *Coccothraustes vespertina*, eating the fruit dropped by those in the tree, this is eminently characteristic of both species. The Pine Grosbeak rarely feeds on the ground, while the Evening Grosbeak commonly does so. Other flocks of both species were observed flying in a southerly direction at a considerable height. These flocks consisted of from half to a dozen birds each.—ERNEST E. THOMPSON.

February 10th, saw three Evening Grosbeaks on College Street.—C. E. PEARSON.

February 10, saw a flock of about ten birds on Rose Avenue.—J. B. WILLIAMS.

February 10, I secured three males and three females, two of the latter

being alive and almost uninjured. Altogether I have collected thirteen specimens up to date.—G. E. ATKINSON.

February 10, on Surrey Place I saw one Evening Grosbeak among a flock of about twenty-five *Pinicola enucleator*.—HUBERT H. BROWN.

February 10, in the Queen's Park I saw three Evening Grosbeaks eating the berries of the mountain ash, but I failed to secure any.—C. E. PEARSON.

February 11, I have two fine male Evening Grosbeaks alive, which were taken on February 11. They seem to be taking kindly to captivity and their new food, they will take mountain ash berries from the hand. I hope to be able to keep them and hear their song.—WM. CROSS.

February 11, I caught three female Pine, and one female Evening Grosbeak alive by the aid of a pole, and fine wire noose. The birds are so tame that it is easy to slip a noose over their heads as they feed. The males however of both species are rather wary, they keep to the top of the trees, and fly off even at a slight alarm, so I failed to secure any males alive. Immediately on being caught the Evening species utters a loud cry or shriek which it keeps up for some time, and the Pine Grosbeak cries out in a much weaker and more husky voice. When put in a cage the Evening Grosbeak set upon the others and used them very badly, having a great advantage in the powerful bill.—E. E. THOMPSON.

February 11, I saw a beautiful male specimen in the Queen's Park.—C. E. PEARSON.

February 13, I secured a male specimen on Howard Street, Rosedale. J. A. VARLEY.

February 15, the last observed flock of Evening Grosbeaks, at Lorne Park is reported by Mr. Luker, for February 15.—ERNEST E. THOMPSON.

February 23, I saw three Evening Grosbeaks in the city.—J. L. JACKSON.

February 25, for the past few days Evening Grosbeaks have been common in East Toronto.—C. W. NASH.

March 16, I observed Evening Grosbeaks in my garden on this date, they were feeding on the apples left on the trees from last year.—MRS. J. R. BARBER, Georgetown.

March 17, we had these birds here the greater part of the winter. In one corner of my yard there is a mountain ash, which was plentifully covered with berries, that proved a glorious feast for the little beauties.

Several times I had my gun ready to secure specimens, but my heart failed me each time. They have been noticed in bunches of three to five, all over this section, and are exceedingly tame, a number were secured by Mr. Melville, our local taxidermist.—A. P. CORNELL, M.D, Gravenhurst.

March 19, I observed two evening Grosbeaks on this date in our orchard.—MRS. J. R. BARBER, Georgetown.

April 11, at Todmorden, north-east of Toronto, I saw five Evening Grosbeaks on a birch tree, near Taylor's Paper Mills, there were four males and one female. On returning half an hour afterwards they had flown, and hearing them in a piece of woods close by, I went over and found a small flock in the top of a pine tree. They were playing with each other, apparently pairing, but although the males exceeded the females in numbers there was no fighting. They were uttering their characteristic whistle and another call which I never heard before, the whistle blending into a soft musical r-r-r-r-r. These calls repeated by a number of birds made a very pleasing little concert. I watched them as they flew from tree to tree several times, and I counted thirty-five specimens, of these at least twenty-four were males. At one time nineteen settled on the top of a red oak, so closely together that a charge of small shot might have killed every specimen. On walking about a mile homewards I came on a flock of over fifty in R. Davies' orchard, feeding on the ground among brewery refuse which was scattered as manure.—W. BRODIE.

April 13, while shooting at Chester with Mr. Jas. R. Thurston we came upon a flock of about fifty birds, feeding on brewery refuse. We collected seven males and females. There were more males than females in the flock.—JOHN EDMONDS.

April 15, while collecting on Well's Hill I came across a flock of Evening Grosbeaks which numbered about thirty, in the top of a clump of pines. I followed them and eventually secured five females and three males, one of the former taken alive. I only observed six or seven males in the flock. These birds have been absent almost entirely from Toronto since March 1.

April 17, I saw a female take several straws from a Sparrow's (*Passer domesticus*) nest, and expecting she was building I followed her. She carried them about for some time and at last carelessly dropped them on top of a witch hazel tree and left them.

April 21, the birds were observed in the same place, but no further attempt at nesting was apparent, nor did they seem paired.

April 29, these birds are still here.

May 7, 18, and 26. I saw the same birds, but they got shy and at last disappeared as mysteriously as they came.—G. E. ATKINSON.

I have not observed the Evening Grosbeaks at Mildmay, and I have come to the conclusion that they were not seen north of Guelph.—W. A. SHOENAU.

Evening Grosbeaks are quite unknown in this district. Mr. W. P. Melville, collected a few at Gravenhurst in March, 1890, the only Muskoka specimens I ever heard of.—A. KAY, Port Sydney, Muskoka.

January, 1890, Evening Grosbeaks common here, four specimens collected.—W. SUTHERLAND, Orillia, Ontario.

March, 1890, several specimens of the Evening Grosbeak were seen here, a few were collected.—W. P. MELVILLE, Gravenhurst, Ontario.

A large number of Evening Grosbeaks arrived here about the first of March, 1890, and they were apparently feeding on the ash berries and the cedar. They stayed here about five weeks, leaving the first week in April. I have not observed any since. I mounted I think about a dozen birds for different persons in this neighborhood, there were some very fine specimens among those I mounted, and I have four or five still in my possession.—R. C. BURT, Chemist, Chatham, Ontario.

Food of Evening Grosbeak determined from dissections. All the birds were collected in the vicinity of Toronto, they were all fat and the stomachs of all were full.

Jan. 21, ♀, seeds of white ash and maple.

24, ♀, crop and gizzard, seeds of maple.

24, ♂, crop and gizzard, seeds of maple.

24, ♀, seeds of ash.

25, ♂, seeds of ash.

25, ♀, seeds of ash.

26, ♀, seeds of white ash and maple.

26, ♂, seeds of mountain ash.—E. E. THOMPSON.

Of the eighteen specimens examined by me, all were very fat and the stomachs in nearly every case full. The contents were as follows:—

Jan. 25, ♀, nutlets of *Prunus serotina*, with pieces of the shell and sand.

25, ♂, nutlets of *P. serotina*, shell and sand.

25, ♀, nutlets of *P. serotina*, shell and sand.

25, ♂, seeds of *Fraxinus americana*, nutlets of *P. serotina* and *Pyrus acuparia*.

25, ♂, nutlets of *P. serotina*, and broken up shell.

Jan. 25, ♀, the crop and gizzard full of nutlets of *P. serotina*, and broken up shell.

21, ♂, nutlets of *P. serotina*, whole in crop, in gizzard broken up with pieces of shell and sand.

21, ♂, nutlets of *P. serotina*, pieces of shell and sand.

21, ♀, nutlets of *P. serotina*, shell and sand.

21, ♀, nutlets of *P. serotina*, shell and sand.

21, ♀, nutlets of *P. serotina*, shell and sand.

21, ♀, nutlets of *P. serotina*, shell and sand.

Feb. 1, ♂, nutlets of *P. serotina*, and *Crætagus*, sp.

1 ♂, seeds of *F. americana*, and sand.

1, ♂, seeds of *F. americana*, and sand.

8, ♂, seeds of *Pyrus acuparia*, and sand.

8, ♂, seeds of *Pyrus acuparia*, and sand.

8, ♀, seeds of *Pyrus acuparia*, and sand.—DANIEL G. COX.

Food of the Evening Grosbeak.—Of the seventeen specimens dissected by me, all were in good condition, it would be more accurate to say they were fat, the gizzards were all full, and all were collected in or near Toronto.

Jan. 16, ♂, broken nutlets of *Crætagus* sp.

16, ♀, seeds of *Fraxinus americana*, sand.

18, ♀, broken pits of *Pyrus acuparia*, craw and gizzard full.

18, ♀, pits of *P. acuparia*, seeds of *F. americana*, sand.

18, ♀, seeds of *F. americana*, sand.

18, ♀, seeds of *F. americana*, sand.

22, ♀. sprouted seeds of *F. americana*, sand.

22, ♂, seeds of *F. americana*, sand.

22, ♂, seeds of *F. americana*, broken nutlets of *Crætagus*, sp.

22, ♂, seeds of *F. americana*, pits of *P. acuparia*, sand.

22, ♀, seeds of *F. americana*, pits of *P. acuparia*, sand.

22, ♀, broken pits of *Prunus virginiana*, *P. acuparia*.

22, ♀, broken pits of *P. virginiana*, *P. acuparia*, seeds of *F. americana*.

25, ♀, broken pits of *P. virginiana*, sand.

25, ♀, seeds of *P. acuparia*, sand.

25, ♂, seeds of *P. acuparia*, *Hamamelis virginiana*, sand.

25th, ♂, seeds of *P. acuparia*, *F. americana*, sand.—W. BRODIE.

Evening Grosbeak at Hamilton, Ont. — This bird was first observed here on December 19, feeding on the berries of the cedar; flock after flock passed along, going east, till near the end of January, when for a few days none were seen. I heard of them all along the north shore of the lake, as far down as Kingston. About February 10, the return migration began, and was very active while it lasted, but they were only noticed for three or four days. At this time they fed mostly on the seeds of such apples as were found still hanging on the trees in the orchards, the berry bushes being well cleared of fruit on the eastern trip. I made enquiry at different points west to find out if possible by what route they travelled, but Chatham was the only point where I heard of them, around Chicago they were not observed. Most likely they came down the east shore of lake Huron.—T. MCILWRAITH.

Evening Grosbeak.—This bird is a common winter visitor to the Province of Manitoba, frequenting the woods along the banks of the Assiniboine River in great numbers; on the Red River it is common at times, but does not appear to settle down into permanent winter quarters there. In the Riding Mountains latitude 50° 30′ I found it common in December 1884, the thermometer at the time ranging from 30° to 40° below zero.

It is also found in all other parts of the Province that are heavily timbered, its favorite resorts being the groves of North-west maple or box elder, which usually grows on the banks of rivers or lakes, on the seeds of this tree it feeds, perhaps occasionally varying its diet with buds of other deciduous trees. I examined the stomachs of a great many in Manitoba, and never found anything else contained in them. Whilst here they seldom visit the low scrub or the ground, except in spring, when they will sometimes crowd thickly together on a bare spot, apparently seeking gravel for digestive purposes.

They first arrive early in October, continually increasing in numbers until the 1st of December, when they reach the maximum, and they remain until about May 16th, when they all disappear together.

The following are dates of their arrival and departure for three years:

FIRST SEEN.	LAST SEEN.
1884,	May 16th, several flocks.
1885, October 12th, one flock.	May 16th, many seen.
1886, October 1st, a small flock.	April 23rd, a few seen.

Mr. Thos. S. Roberts records them as regular visitors in winter to Minneapolis, Minnesota, and in 1880 says he saw them last on May 3rd, though they usually stay much later, but the weather being very warm at that time, probably hastened their departure. At this place they

resort to an island which is timbered in part with maple and box elder, the seeds of which they make their regular diet, as they remain hanging in bunches on the trees through the winter.

During the winter in Manitoba they are usually seen in small parties, not exceeding six or eight in number, and are quiet and unobtrusive in their manner, flitting about the maples feeding, occasionally uttering their single call note, which very much resembles that of the European Bullfinch.

Early in April they congregate into large flocks, in which the males preponderate, they are then restless, frequently rising from the tops of the trees and making long flights high in the air over their haunts.

In view of the fact that this bird's nest has never been found, it may be worth noting, that the Pine Grosbeak, its usual winter associate, whose nest and breeding place are known, arrives in this Province about the middle of November, and leaves here about the end of March, whilst the Evening Grosbeak arrives about six weeks earlier in the autumn, and remains about six weeks later in its winter quarters, from which I should infer that it does not go so far from its winter haunts to nest, as does the Pine Grosbeak.

In January 1890, immense numbers of these birds were seen in eastern Canada and the United States, they having for some unexplained reason wandered far from their range. A most peculiar feature of this movement in Canada was the first appearance of the birds in the east, and their gradual extension westward, exactly the reverse of what one would expect from birds whose habitation is the interior of north-western America.

The first records I have of their occurrence at that time are from near Montreal in Quebec, and Kingston in eastern Ontario, during the first two weeks of January. At the end of this month they had reached Toronto, where I saw them in considerable numbers; at this time they were also seen in the States of New York, Massachusetts, and Connecticut. Early in February they had reached the States of Ohio, Michigan and Illinois. Judging from these records, I assume that a large number of the birds must have migrated from their summer home in an easterly direction, until they reached the Province of Quebec and some of the eastern States, thence they gradually worked westward along the Great Lakes to their proper habitation.—C. W. NASH.

Observations on migration of Evening Grosbeaks, 1890.—On the 21st, January, 1890, Messrs Gray, Marsh, and Mitchell, reported a flock of about three-hundred Evening Grosbeaks, males and females, on Rosedale Heights, north of C. P. Railway track, they were feeding on the ground and seemed to find abundance of food. The subsequent examinations of the stomachs determined the food

to be nutlets of the wild cherry, *Prunus serotina*, which had fallen the year before. The above named gentlemen secured nine males and fifteen females that day besides leaving several wounded birds which escaped to the neighbouring gardens. They were in excellent condition, being very fat. The birds remained in that vicinity about two weeks and during that interval Gray, Mitchell, and myself visited the place, and obtained specimens each time, in fact they were seen there as long as the food lasted. From February 1st, to 8th, I saw several small flocks on Ontario and Howard Streets, and on the Danforth Road, feeding on the seeds of mountain ash, *Pyrus acuparia*, and on February 27th, I saw a flock of about thirty Evening Grosbeaks, in company with about a dozen Pine Grosbeaks, *Pinicola enucleator*, in Mr. William's garden on Ontario Street, stripping an apple tree which contained about half a bushel of rotten fruit, that had not been gathered the year before. On making an examination of the refuse under the tree after the birds departed, I found that only the seeds had been eaten, as in every case where I have made examinations of the stomachs of these birds, I found the kernels of the different seeds, and nutlets composing their food have been entirely denuded of their shell.

I had reports given me, almost every day by many reliable persons, of flocks being seen on Logan and Pape Avenues, from the 1st to the 20th March, on which last date while collecting Gulls in the vicinity of Norway, I saw a flock feeding on the cones of a large pine tree, *Pinus resinosa*, this is the last time I saw the birds that year, although I heard several reports of them being seen till the middle of April. In my opinion from the first appearance of the birds in January, until the middle of April, they were seen every day by some persons about Toronto and suburbs, and that they came to us for food is very evident by their remaining with us so long, and their being so exceedingly tame. Numbers of them were killed by boys with sticks and catapults every day, in the streets of our city.—D. G. COX.

I have made as extensive enquiry as possible in regard to the occurrence of the Evening Grosbeak in this vicinity in the early part of January, 1890. All the evidence that I can collect goes to show that the birds arrived here about the 1st of January, and at least some of them remained until March.

In looking over my notes, I find an entry on January 20th, to the effect that the Evening Grosbeaks, a heretofore unknown bird in this vicinity, had been with us in large numbers for three weeks.

About January 1st, a boy brought me a bird that he said I might want for a specimen, as it had very bright plumage. The bird was new,

to me, although I knew it to be a Grosbeak. It proved to be a male Evening Grosbeak, and was shot in the asylum grounds.

The birds remained with us several weeks, in fact I saw one early in March, feeding on mountain ash berries. In the asylum grounds they were to be found very constantly, in the tamarac and mountain ash trees, and several times I saw them in the tamarac with the Pine Grosbeaks, which were quite common in the winter of 1890.

On the 13th or 14th January, 1890, Mr. Geo. Nicol of Cataraqui, shot a male and female Grosbeak (Evening), and sent them to Mr. R. M. Horsey, who wrote a letter on the subject to the *British Whig*, January 17th, and Mr. Horsey corroborates my observations in regard to the time the birds remained with us, in the following note: "I have a specimen (male) given me by Sir Richard Cartwright's gardener, which he procured about the end of January, and which he shot at the "Maples," Sir Richard Cartwright's summer residence on the banks of the St. Lawrence, a short distance from Kingston, where I understood from him the birds remained until early in March, or towards the middle of the month."

In the asylum grounds the ash berries seem to have been the chief attraction, but the birds were not nearly so numerous with us as at the eastern part of the city, and along the banks of the St. Lawrence. The reason for their presence there was that the woods are full of red cedars, and Barriefield Common, on the eastern side of Kingston, is covered with junipers. The birds subsisted on the berries of the red cedar and juniper.

Mr H. Stratford, taxidermist, tells me that the crops of the many birds he mounted, were invariably filled with the red cedar and juniper berries.

There is no record of any of the birds having been kept in captivity and I cannot find out how many specimens were procured, but Mr. Stratford, the taxidermist, mounted several for different persons, and Mr. Horsey had three. The birds were quite common, and little difficulty would have been experienced in securing a large number. In the asylum grounds I would not allow any of them to be destroyed, after the first had been shot.

Mr. Stratford tells me that shortly after the arrival of the Grosbeaks here, they were observed in Perth, (Lyn), and if you wish I can find out the particulars regarding this, as Perth, (Lyn), is further east than Kingston. My impression is that the migration took place from the west, as the dates that the birds were observed in the western part of Ontario, were certainly earlier than our dates.

I find that I made a slight mistake in my notes on Grosbeaks: instead

of Perth I should have written *Lyn*, a place six miles west of Brockville.

Mr. Nicol of Cataraqui was driving near Lyn, when the Grosbeaks were here and saw a large flock of the birds. Two were also sent to Mr Stratford, from McDonald's Corners. Mr. Stratford mounted eleven Evening Grosbeaks in all, nine obtained from this locality, and two that were sent from McDonald's Corners, in the County of Lanark.

Dr. A. C. Bowerman, of Bloomfield, near Picton, Prince Edward County, writes as follows:

"I have the skin of a female Evening Grosbeak. They came about Christmas, and remained up to March, and the birds were quite numerous.

Mr. Elkington, taxidermist, brought me a bird about the 1st of March, which I skinned."—C. K. CLARK, M. D., Kingston.

During the thirty years I have lived in Guelph, I have never known a single specimen of the Evening Grosbeak having been taken.

The Pine Grosbeak, *Pinicola enucleator*, during that time has visited this section of the country several times, and the Rosebreasted Grosbeak, *Habia ludoviciana*, is comparatively plentiful in the woods of the surrounding country, but I am not aware of any of the Evening Grosbeak being seen in this vicinity.—JAS. GOLDIE, Guelph, Ontario.

With reference to that interesting flight of Evening Grosbeaks, in the winter of 1889-90. On turning up my notes I find the first record on January 21, 1890, when I saw for the first time, a pair of these birds alive. They were upon an orchard tree in the town. On the 24th, I received from my friend Mr. McIlwraith, of Hamilton, a pair of these beautiful birds in the flesh, and while examining them at my window I happened to look out and there upon the ground, under my very nose, was a pair of the beauties. I am almost ashamed to say I ran for my gun and shot them both. There were three more in one of the trees uttering a plaintive call note as if for their mates. Next morning on looking out I saw six of these birds either hens or young birds, found they were feeding upon the seeds of the *Robinia pseudacacia*, or common locust tree the pods of which strewed the sidewalk. The two pairs I mounted and have in my collection. In their stomachs I found only the above seeds. On February 20, five of them were still seen feeding upon the locust tree although they were occasionally seen upon the ground feeding. March 15, saw four hens or immature males. March 29, great snow storm, covers the ground six inches deep. Saw six Evening Grosbeaks feeding in the locust tree, which is the last record I have of them. During January, February, and March, 1890, I heard of these

strange birds having been seen at different points, six or seven miles from here, and always the same habits reported, that they are rather sluggish in their habits, sitting quietly in the trees occasionally uttering their sad call note, but no attempt at a song. I may say that although I could have collected a number, I only took the one pair. From reports I must have heard of twenty-five or thirty birds in small parties, which could hardly have been the same lots that are in this section.—G. A. MACCALLUM, M. D., Dunnville, Ontario.

I have the assurance of Mr. Fletcher, Entomologist for the Agricultural Department of the Dominion of Canada, that none of these birds were observd at Ottawa.—W. BRODIE.

The first time I came across this rare visitant of southern Ontario was in the spring of 1855, in Glanford Tp., near Hamilton. There were five together on the ground, of which I shot two. This occurred after the snow had gone, or was nearly so, in early April.

I removed from that section and came to the northern part of Huron County a few years after. The first time I got one of these rare birds was in the winter of 1861. This occurred in the middle of February, and I had the skin for some years, but it was lost in a fire, this was a female. I saw several during the winter of 1861. The snow, however, was so deep in the bush that it was impossible to collect any. In the next year, 1862, several were seen as I was driving round in my cutter to visit sick people, also *Pinicola enucleator*, the Pine Grosbeak, was comparatively scarce. This I always found in swampy places, on scrubby pines, tamarac and spruce, and also I saw once an Evening Grosbeak sitting on a high bush cranberry, on the roadside within ten yards of me, pecking at the berries. This was in the township of Turnberry. In 1865, one of these birds was sitting high up on a soft maple, and I shot it.

In 1874 one was shot by me but much torn up with heavy shot, a male.

In 1889 quite a number were found all over this section during the months of January and February, several of which I saw in the possession of Dr. Tennent, and Mr. Anderson.

In 1891 I shot one in Kinloss Township. It was on a tree, by the banks of a creek, February 13. It may seem strange, yet on not one occasion did I ever hear any notes made by this bird.—JOHN H. GARNIER, M.D., Lucknow, Ontario.

No evidence of an eastern migration was obtained, but several observers reported flocks flying westward along the lake shore. The consensus of opinion seemed to be that the birds which came first, remained in or around the city until late in the spring, or were killed.

A number of observers were of opinion that the birds frequented the same localities until the supply of food was exhausted. On the southern slopes of the hills north of the city and of the Don ravines, the snow soon melted away, and the fallen seeds of *Prunus*, *Crætagus* and *Fraxinus* were abundant under the trees, and of course the birds were found feeding on the ground.

The food of this bird in Manitoba is the seeds of the box elder, *Negundo aceroides*, (Nash) the seeds hang on the trees during the winter and are picked off by the birds, but although many pistillate trees of this species grow on the Don flats and hill sides, which were heavily loaded with fruit, the birds were not observed to feed on them, nor did any of the dissections reveal the presence of *Negundo* seeds.

The range of food as shown by stomach dissections was not large.

Seeds of *Robinia pseudacacia*, *Crætagus coccinea*, *Fraxinus americana*, *Pyrus acuparia*, *Prunus virginiana*, *Prunus serotina*, *Acer saccharinum*, *Hamamelis virginiana*, *Juniperus communis*, *Juniperus virginiana*, and although not shown by dissections, they were observed to feed on seeds of apples which were hanging on the trees. The birds freely entered the residential parts of the city, and fed on the seeds of the European mountain ash, an abundant ornamental tree. They were quite unsuspicious and tame, and were unmercifully and wantonly killed with clubs, catapults, revolvers, pea-rifles, and many were taken alive with a slip-noose attached to the end of a long stick. We have collected reliable information of 453 specimens, which were collected in and near Toronto, most of which were made into skins or mounted by taxidermists and students of ornithology, but the actual number killed must have exceeded 1000.

Several living pairs were collected and kept for some time in cages, but they did not pair. At this time, February 17th, 1892, we know of but one living specimen, a female, in excellent condition.—EDITING COMMITTEE.

Since last date given, no birds have been noticed at Toronto to date of going to print. November 25, 1892.

CANADIAN WILD FLOWERS.

By D. W. Beadle, B.A., LL.B.

(Read 9th April, 1892.)

The purpose of this paper is to awaken an increased interest in our native wild-flowers, by shewing that they are worthy of a prominent place in our flower gardens, and thereby to rescue at least some of them from impending extermination.

Hitherto the floral embellishment of our lawns has been largely confined to the annual planting of tender exotics. This necessitates a yearly expenditure in the preparation of beds, procuring and setting out of plants and subsequent care. After planting, a considerable interval must usually elapse before sufficient growth can take place to make the bed an attractive object. When at length it attains to the fullness of its display, it is the same unvarying picture, presenting no new feature throughout the season, becoming even tiresome by reason of its uniformity. And at the first sharp frost of autumn all the brightness is suddenly extinguished, so that we are fain to have the plants removed out of our sight, and content ourselves with the bare brown earth prospect, until winter covers it with a mantle of snow.

But now a tendency is being manifested towards the adoption of a more natural system of flower gardening, a system that does not demand new plants every season; in which are no bare earth prospects through the spring and fall, nor pinched and shivering look of plants waiting for weather warm enough to enable them to put forth their flowers, nor tiresome monotony of forms and color, and at the last the sudden death of all in a night. In the natural system, the early flowers will begin to appear with the first mild days of spring, and from thence forward new forms and colors are appearing in continuous succession, so that each passing week some fresh object of interest is presented, and when the cooler days and frosty nights of autumn come, there will be no painful sense as of sudden death in the garden; Flora will but wrap her mantle of crimson and gold about her and gently sink into her winter slumber.

At this juncture, when tired of the artificial, public attention is being turned towards a system of flower gardening more consonant with nature, it seems opportune to direct attention to our wild-flowers, to shew to the general public the floral treasures of our own land, and awaken, if

possible, a sense of the appropriateness of enriching Canadian flower gardens with the wealth of Canadian wild-wood beauty, inured to our Canadian climate, and waiting at our very doors to be employed to ornament our Canadian homes. Surely the flowers of our native land are more lovely in our eyes than those of any other. We gathered them in childhood, twined them in our playmate's hair, and linked them with all the joyous memories of youth, so that by the very richness of their associations they speak to our hearts as can those of no other land. Have not many of you, when taking a country outing, paused in your ramble at sight of some woodland flower, and while you looked, the shadow on life's dial fled many degrees backward, and you found yourself listening again to the merry tones of young voices once familiar, and could almost feel again "the touch of a vanished hand;" and as you turned reluctantly away, that simple modest flower had for you a loveliness that the most princely exotic can never possess?

Like the Red-man of the forest our wild-flowers are passing away, and before very long many of them will be gone. The settlement of the country with its attendant industries, must necessarily destroy the conditions favorable to their existence. The axe and the plow are doing their work, and not these alone, but the careless gatherer is pulling them up by the roots, as though anxious to exterminate them as soon as possible. The burning off of the dry leaves is also destructive to those plants, the roots of which lie near the surface; and when the ground is dry and the soil of a fibrous or peaty character, the fire will penetrate to a considerable depth, quite far enough to kill out even those plants that may be called deep rooted. And even when the plants are not roasted to death, the fire consuming the leaves lying on the ground robs them of the food which the decaying leaves supply, and of the moisture which these leaves retain.

What can be done to stay this destruction and preserve to us our native flowers from the extinction which threatens them? Canada has no botanic garden into which they might be gathered. "I speak this to our shame." Once the writer had hopes that a portion of the grounds of the Ontario Agricultural College would be used for an arboretum and garden, into which would be collected such trees as would thrive there, and at least the most interesting of our native plants. Such a collection was thought to be a desirable, if not an essential factor in the education of those designing to devote themselves to rural pursuits. Under the superintendence of a committee of the Fruit Growers' Association, appointed at the request of the Hon. S. C. Wood, then acting Commissioner of Agriculture, which was composed of Mr. Wm. Saunders, now

Director-in-chief of experimental farms, Mr. James Goldie, of Guelph, an enthusiastic botanist, and the writer; plans were prepared and a commencement made, thus laying the foundation of such an institution. But there came a change of ministers, and with that a change of counsels, and the discharge of the committee. There is now no prospect of such an arboretum and garden being established in our day, nor for many a day to come. Hence, the only hope of preserving to those who will come after us the beautiful plants that now are scattered in wild-wood shade, by running stream, in marshy fen, on sunny bank, and in open prairie, seems to lie in the possibility of being able now to awaken in our citizens, and especially in those who with the writer claim this as the land of their birth, an interest in these wild-flowers as a means of beautifying the grounds about their dwellings.

In order to the awakening of this interest it will be necessary to substitute a more simple and natural taste in the place of that engendered by the bedding-out system so long in vogue, which demands masses of blazing color, ribbons of red, white and blue, and formal designs in flower or foliage in which there is not one touch of nature; yet this change will come, its dawn is already breaking. Deep down in the human heart there ever lives a chord that vibrates in unison with nature. It is made apparent by the desire so very commonly cherished by busy toilers in the marts of commerce to have a country seat in which they may spend a part of each year, and to which they may retire in life's evening. Let a fair trial of a natural system of gardening be made, it will then be found that it responds to this love of nature, that it gives a satisfaction and pleasure that apparent art is powerless to confer.

Further, it will be necessary to disabuse the public mind of a prevalent impression that the wild-flowers do not take kindly to civilization. One instance of their successful domestication is more potent than any argument. Fortunately such an instance is at hand, would that there were more. Mr. Jas. L. Hughes has 328 varieties of wild-flowers growing in his garden, and he states that "nearly every variety grows as well under cultivation as in its native locality, many of them do better." Could we have a few more such gardens, exemplifying the adaptedness of Canadian wild-flowers to the requirements of floriculture, there would be good ground to hope that such an interest might be awakened as would secure the cultivation and thereby the preservation of our most beautiful and desirable species.

The enumeration of all the wild-flowers that could well be employed in ornamental gardening would be but a wearisome repetition of names, yet it seems desirable to mention some of the most prominent, those most likely to interest the general public.

Among the very first to bloom in early spring is the trailing Arbutus, *Epigæa repens*, putting forth its delicately rose-colored flowers, laden with a rich spicy fragranee, even before the snows have ceased to fall. It is a shade loving plant that would thrive under the trees that skirt so many of the city lawns. In this connection we may name the pretty little *Linnæa borealis*, a slender creeping evergreen that loves the cool shade. Its graceful nodding flowers, purple and white, and sweetly fragrant, appear in June. It was a special favorite of the great Swedish botanist, and therefore bears his name. Also the Winter-green, *Gaultheria procumbens*, is most at home under the shade of evergreen trees. Its nearly white flowers appear in July, followed by bright red berries. *Mitchella repens*, as its name indicates, is a creeping plant, it thrives well in dry soils, is covered in June and July with white flowers that are pleasantly fragrant, followed by a profusion of bright scarlet berries which continue through the winter. This pretty plant is not only useful to hide the bare earth under trees, but its bright shining evergreen leaves set off with the scarlet berries, make it an appropriate Christmas decorative plant. We have yet another evergreen trailer bearing flesh-colored fragrant flowers in June, suitable for planting in dry soils, known by the name of Pipsissewa, *Chimaphila umbellata*. These and other evergreen plants, trailing in habit, and thriving best under the shade of over-spreading trees, could be made to contribute greatly to the charm of our lawns, not only by carpeting the earth beneath them, but by filling the air during their flowering season with grateful odors.

We have several very pretty *Anemones*. *A. hepatica* vies with the *Epigæa* in time of flowering. Its blue flowers running through many shades, sometimes white, are too well known to need description or words of praise. It is at home in partial shade. *A. patens, var. Nuttalliana*, has large purplish flowers in early spring. It prefers the open ground. *A. parviflora* gives us white flowers in May and June. *A. multifida* is more rare, its flowers are red, opening in June. *A. Pensylvanica* continues to display its white flowers from June to August.

It is quite possible that we have four varieties of *Trillium*, though the writer has not seen the white nodding *T. cernuum*, nor the painted *T. erythrocarpum*, (*T. pictum Pursh.*) The flowers of the latter are white, marked with purple stripes at the base of each petal. With *T. grandiflorum*, the large white flowers of which are so showy, remain so long in perfection, turning before they disappear to light rose-color; and with *T. erectum*, the dark purple flowers often intermingled with the white blooms of *T. grandiflorum*, you are all familiar. Our European cousins know how to appreciate their beauty, so much so that large numbers have been shipped to the other side of the Atlantic.

Dicentra gives us two interesting species. *D. cucullaria* prefers rich soil and moist shade. The leaves are finely cut, indeed the whole plant has a most delicate appearance. The flowers, white tipped with light yellow, are at once pretty and odd. *D. Canadensis* blooms in May. The heart-shaped flowers, greenish white tinged with rose, have the fragrance of hyacinths.

We are rich in Violets. The season of bloom extends from early spring until autumn. *V. rotundifolia* and *V. pubescens* are yellow, the round-leaved flowering in spring, the other in early summer. *V. cucullata* varies greatly both in the size and color of its flowers, which is almost of every shade, from nearly white to the deepest blue. The flowers appear in early spring. *V. canina, var. sylvestris*, (*V. Muhlenbergii*) flowers light blue, and *V. Canadensis*, flowers white, upper petals often tinged with violet on the under side, continue in bloom all summer. *V. sagittata* and *V. pedata* are large flowers, the latter especially, its flowers being an inch in breadth. They both vary from light to dark blue. *V. pedata* is a most elegant plant, its flowers have a delicate and agreeable fragrance, and last long in perfection. In grace and beanty it is the rival of any exotic. It thrives best in a somewhat sandy soil. The white flowered *V. blanda* is also, though faintly, sweet scented. All of these violets are of easy culture, take kindly to the garden, and increase rapidly.

Two species of *Lobelia*, *L. cardinalis*, the flowers a most brilliant scarlet, and *L. syphilitica*, light blue, are late summer bloomers, the former exceedingly showy, both of easy cultivation, care being taken to plant the *cardinalis* in moist loam.

Our Lilies, *L. Philadelphicum, superbum* and *Canadense*, are long since to be found in every collection of hardy lilies that makes any pretense to completeness.

Campanula rotundifolia, the only one we have that is perennial, unless *C. linifolia* be accepted as a species, is well-known as the Harebell of Europe. It is a pretty graceful plant, grows well in any good garden soil, and yields its bright blue flowers in profusion. This is the flower referred to by Sir Walter Scott:

> "E'en the slight Harebell raised its head
> Elastic from her airy tread."

We have a large number of pretty things belonging to the Orchis family, several of them of such showy appearance as to make them desirable ornaments of the garden. By giving attention to the preparation of the bed, selecting a cool well shaded locality, and incorporating

with the soil a supply of peaty loam and sphagnum, they can be grown with most gratifying success. They endure any amount of cold, but perish if subjected to severe drouth. Once started they will take care of themselves, yearly increasing in strength and beauty. To the student of nature they are all exceedingly interesting, especially in contrivances found in many to secure cross-fertilization. The following are named as being the most interesting to the decorative gardener: *Orchis spectabilis*, flowers pink purple, undivided lip white, in May. *Habenaria ciliaris*, bright orange yellow, bordered with a long copious fringe, July to September; *H. blephariglottis*, flowers white and also fringed, July; *H. fimbriata*, flowers purple, fringed, June. *Cypripedium candidum*, flower small, white, May or June; *C. parviflorum*, flowers about an inch long, bright yellow and fragrant, June; *C. spectabile*, the most showy of them all, about two feet high, flowers two inches long, three or more on a stalk, white, marked with purplish pink, and last a long time in perfection.

The foregoing will suffice to indicate that we have native plants worthy of a place in ornamental gardening. It is necessarily very incomplete. We have but touched the hem of our Flora's robe. Intentionally only those have been mentioned that seemed most likely to interest those who plant for ornament, and of such only a small part, and that part wholly confined to the flowering plants. Yet, planting for ornament in the eye of one who is a true lover of nature, will not be confined to these. There is marvelous beauty to be found among the flowerless plants. In many of the lawns are to be found places just the thing for ferns. Can anything be prettier than a well arranged fern-border? and we have not far to seek in order to fill such a border with Canadian ferns of graceful form and charming beauty. Can we not do something to quicken into action the love of nature that all possess in greater or less degree, so that the beautiful things indigenous to our climate shall be cherished, not neglected because they are Canadian?

ST. COLUMBA OR COLUM CILLE.

BY REV. NEIL MACNISH, LL.D.

(Read 28th November, 1891.)

In his Essay on Gaelic literature, language and music, which is to be found in Fullerton's Scottish Highlands, Dr. MacLauchlan, the talented translator and editor of the Dean of Lismore's Book, thus writes: "It has been often said that the Literature of the Celts of Ireland was much more extensive than that of the Celts of Scotland; and that the former were in fact a more literary people. Judging by the remains that exist, there seems to be considerable ground for such a conclusion. Scotland can produce nothing like the MS. collections in Trinity College, Dublin, or the Royal Irish Academy, . . . We have our doubts as to Ireland having furnished Scotland with its Gaelic population, and we have still stronger doubts as to Ireland having been the source of all the Celtic Literature which she claims. . . . To say that a work is Irish, because written in what is called the Irish Dialect, is absurd. There was no such thing as an Irish Dialect. The literary dialect said to be Irish, is nearly as far apart from the ordinary Gaelic vernacular of Ireland as it is from that of Scotland." To St. Columba and his successors on the Island of Iona, the honour belongs of having during several centuries formed a constant link of connection between the Gaels of Ireland and the Gaels of Scotland. Than the Island of *I* or Hy, or Iona or Icolumkill, there is no place more famous or dearer to all lovers of enlightenment in the earlier centuries of the Christian faith. Iona continued for many generations to be the grand centre whence radiated to various portions of Great Britain, as well as of the Continent of Europe, intellectual and religious light. Dr. Samuel Johnson, who certainly cannot be accused of having or of entertaining any large exuberance of affection for the Scottish Highlands, followed the promptings of his more serious and sensible nature, and thus wrote with regard to Iona: "We were now treading that illustrious island which was once the luminary of the Caledonian regions, whence savage clans and roving barbarians derived the benefits of knowledge, and the blessings of religion. Far from me and from my friends be such a frigid philosophy as may conduct us indifferent and unmoved over any ground which has been dignified by wisdom, bravery or virtue. That man is not to be envied whose patriotism would not gain force upon the plains of

Marathon, or whose piety would not grow warmer among the ruins of Iona."

In the preface to Lluyd's Archæologia Britannica which was published in 1707, there are to be found complimentary addresses in Latin verse by Gaelic ministers. Those addresses extol the zeal and learning of the Welsh philologist, and are couched in Hexameters and Alcaics and Sapphics of such tuneful accuracy as to show that the ministers of that time were good classical scholars. The Rev. John MacLean, at that time minister of the parish of Kilninian, Mull, bestowed warm commendations in Gaelic verse on the father of Celtic philology. With regard to the antiquity of Gaelic, he thus writes:

"Si labhair Padric 'nninse Fail na Riogh
'San faighe caomhsin Colum naomh tha'n I;
Na Francigh liobhta 'lean gach tir a mbeus
O I na ndeori, ghabh a mfoghlum freimh.
B'i bhoide muinte' Luchd gach duthch is teangth.
Chuir Gaill is Dubhghaill chuic'an tiulsa' n'clonn,
Air Sar o Liath biodh adh is cuimhnn' is buaidh,
Do rinn gu hur a dusgadh as a huaimh."

Those verses have been happily rendered into English verse:

"T was Gaelic Patrick spoke in Innis-Fayl
And sainted Calum in Iona's Isle,
Rich polished France where highest taste appears,
Received her learning from the Isle of tears.
Ie alma mater, of each tribe and tongue
Once taught for France and Germany their young.
Great praise and thanks, O noble Llwyd be thine,
True learned patriot of the Cumbrian line!
Thou hast awaked the Celtic from the tomb,
That our past life her records might illume."

The Island of I or Iona or Icolumkill, is on the Western Coast of Argyllshire. A few miles north of it is the Island of Staffa with its wonderful cave, which bears the name of Fingal's Cave. The Giant's Causeway in the north of Ireland may be regarded as a continuation or a reproduction of the same basaltic and many sided columns which go to form Fingal's Cave, though seventy or eighty miles intervene between Staffa and the north of Ireland. North-east of Iona lies the Island of Ulva, famous as the birthplace of the ancestors of the illustrious David Livingstone. Not far from Iona is a group of islands, forming a parish to which the designation, the parish of small isles is given—a parish of which the Rev. Zachary Macaulay, the great-grandfather of Lord Macaulay the English historian, was once minister. To the north-east of Iona lies Morven—a name which every lover of Gaelic associates with

the MacLeods than whom no more patriotic or elegant Gaelic scholars have appeared in this century. Mull, Colonsay, Islay, Jura, Tiree—such are the names of other islands that lie around Iona—islands from which men have repeatedly gone forth, who achieved no small success and renown as well in the strife of arms as in the vigorous prosecution of the peaceful industries and professions of life. Iona is thus situated in the heart of classic ground. It belongs to the Ducal House of Argyll. The present Duke, true to his varied culture, has shown a praiseworthy interest in Iona, and in the preservation of those buildings and graves and monuments which, calling up as they do sacred memories and hoary occurrences, have survived the rude Vandalism of the Scandinavians.

Very great ingenuity has been expended for the purpose of determining what the meaning or derivation of the word Iona is. There can be no doubt that I, pronounced in English *ee*, is the original form of the name Iona. The inhabitants of Iona and of the surrounding islands always apply the name I to the island in question, and thereby furnish the best evidence as to what the original name of the island was. I is a Gaelic word for island, I, *Innis*, *Innsean*. Flathinnis, a common appellation for *Heaven*, properly signifies the island of the brave or noble men. Latin writers of the time of St. Columba spelled I, the name of Iona, *Hy*, *Hia* *Hya*, and formed the adjective *Hyensis*, *Huensis*, from it. It appears that the designation *Ioua insula* was frequently applied to Iona. It is said that Colgan, imagining that Ioua was an incorrect form of Iona, substituted the latter word for the former, and thus led the way to the general employment of the term Iona. Fordun supposes Iona to be an adaptation of St. Columba's Hebrew name, "Insula I vel Iona Hebraice quod Latine Columba dicitur sive I Columkill." Adamnan thus writes: "There was a man of venerable life and blessed memory, the father and founder of monasteries, having the same name as Jonah the prophet; for though its sound is different in the three different languages, yet its signification is the same in all. What in Hebrew is Jonah, in the Greek language is called περιστερα, and in the Latin Columba." It has likewise been sought to resolve *Iona* into I *thonn*, the Isle of the waves, and into I shona, the blessed or happy Isle. It seems altogether better to accept the interpretation that the original word or name I was sometimes written *Ioua*, and that by an easy process *Ioua* came to be written Iona. The island has come to bear another name, Icolumkill, in consequence of the intimate and honourable connection which St. Columba had with the fame and fortunes of the island. *Calum-cille* is the common appellation which St. Columba bears among the Gaels of Scotland. The word *kill*, *ceall*, *cill*, is derived from the Latin term *cella*, which among its other significations, has the meaning *shrine* or *chapel*. Ceall

in Irish means Church, a cell or place of retirement. It was customary in Scotland until a comparatively recent period, to have a Burying-ground attached to the Church. The ruins of ecclesiastical buildings can be easily detected in the old Burying-grounds of Scotland. The word *ceall* or *cill* has now come to designate the grave or Burying-ground. Tha è anns a 'chill, he is in the grave, is a phrase that is of common application to indicate that an individual is dead. *Calum cille* was eminently the apostle of the Picts. He was the leader of a galaxy of Celtic abbots, who with Iona as the centre of their operations in Scotland or in Albin—for Scotia was in those days an appellation of Ireland—exercised a deep and wide-spread influence over a large portion of Scotland, as well as indirectly over the north of England, in addition to keeping in close and constant familiarity the Gaels and Gaelic of Ireland and Scotland.

St. Columba was born at Gartan in the County of Donegal, on the 7th December, 521. He was of royal lineage. His genealogy runs thus: he was the son of Felim, the son of Fergus, the son of Conall the son of Neil of the nine hostages—Niall naoi' ghiallach—son of Eochaidh, son of Murdoch, son of Cairbre, son of Cormac, son of Airt, son of Conn of the hundred battles, son of Herimon, son of Mili of Spain. His mother whose name was Eithne was descended from an illustrious King of Leinster. It was thus in a very lordly and influential station that St. Columba was born. At his baptism he received the name Colum, to which the addition of *cille* (the genitive of ceall) was subsequently made in reference to his diligent attendance at the Church of his youthful associations. When he arrived at a sufficient age, he went to Moville (Magh bhile, the lip or margin of the plain) a place that is well known to Canadians who cross the Atlantic. He there became the pupil of the celebrated Bishop St. Finnian. From Moville he proceeded to Leinster, where he was for some time under the instruction of an aged bard called Gemman. After he left Gemman he entered the Monastery of Clonard (cluan ard) over which St. Finnian the founder then presided. St. Cargall, St. Ciaran, Cainneach, were his fellow-students in the Monastery; and subsequently at Glas Naoidhean now Glasneven near Dublin. About the year 553 he founded Dair magh, the plain of the oaks, which was his principal and most famous institution in Ireland. In Leabhar Buidhe Lecain, this account is given of the reason which induced St. Columba to leave Ireland, and to take up his abode in Scotland. On one occasion St. Colum Cille paid a visit to St. Finnen, of Drom Finn in Ulster, and while on this visit he borrowed St. Finnen's copy of the Psalms. He made a copy of the book by remaining in the Church after the people had left it. He was

detected, and when an appeal was made to the monarch of Erinn-Diarmaid MacFerghusa Gerrbheoil, he gave the remarkable judgment which to this day remains a proverb in Ireland, when he said *Le gach boin a boinin*, i.e. to every cow belongeth her little cow or calf, and in the same way to every book belongeth its copy ; and accordingly, said the king, the book that you wrote, O Colum Cille! belongs by right to Finnen. That is an unjust decision, O Diarmaid! said Colum Cille, and I will avenge it on you. Complications afterwards came in connection with the rude conduct of Diarmaid, who seized a son of the King of Connacht, and put him to death for a certain offence, and in violation of the immunity which the young prince might claim, forasmuch as he was in the arms of St. Colum Cille. Colum Cille with his great influence had much to do in inciting and in raising an army to oppose Diarmaid King of Ireland. The result of the conflict was that a battle was fought in which the royal army was routed with a great loss, and the monarch returned discomfited to Tara. Diarmaid soon after made his peace with St. Colum Cille, and his friends. The Saint to relieve his conscience went to confession to St. Molaise of Damhinis. St. Molaise then passed upon him the penitential sentence to leave Erinn forthwith, and never again to see its land. This penance St. Colum soon performed by sailing to the coast of Scotland with a large company of ecclesiastical students and others. They landed on the island of I or Hy. Eugene O'Curry tells us that in O'Donnell's life of St. Colum Cille regarding the Cathach "the Cathach indeed is the name of the book on account of which the battle was fought, and it is it, that is, Colum Cille's high relic in Tir Conaill: and it is ornamented with silver, and it is not lawful to open it; and if it is carried three times to the right around the army of the Cenel Conaill when going to battle, it is certain that they would come out of it with victory: and it is on the breast of a Comharba, or a priest without mortal sin upon him (as well as he can), it is proper for the Cathach to be at going round that army." We are informed by Bede that "in the year of our Lord 565, when Justin the younger, the successor of Justinian had the government of the Roman Empire, there came into Britain a famous priest, and abbot, a monk by habit and life, whose name was Columba, to preach the word of God to the provinces of the Northern Picts. Columba came into Britain in the ninth year of the reign of Bridius who was the son of Meilechon and the powerful king of the Pictish Nation, and he converted that nation to Christ by his preaching and example whereupon he also received from them the aforesaid Island, i.e. I, for a Monastery." In the Anglo-saxon Chronicle, it is stated that in 565 "Columba a mass priest came to the Picts, and converted

them to the faith of Christ. They are dwellers by the northern mountains and their king gave him the Island which is called Ii, Iona. Therein are few hides of land, as men say. There Columba built a Monastery, and he was Abbot there thirty-seven years, and there he died when he was seventy-two years old."

The ecclesiastical influence and government of St. Columba extended very widely. The names of no less than thirty-seven Churches are given which were founded by him in Ireland, and in which his memory was specially venerated. In Londonderry, Sligo, Louth, Kildare, Dublin Longford, Kilkenny, Galway, and other portions of Ireland, Churches and Monasteries were founded by Columba, so that a very large portion of Ireland was visited by him, and acknowledged his ecclesiastical supremacy. In the kingdom of the Scots, there were thirty Churches or Chapels that were more or less intimately associated with the name of Columba. Among the Picts there were twenty-one Chapels with which Columba had a similar relationship. In the Orkney Isles, in Caithness, Sutherland, Nairn, Aberdeen, Inverness, Perth, Renfrew, throughout the Hebrides and other portions of Scotland, Churches were founded by Columba and his followers, or at least owed allegiance to the apostle of the Picts. From the fact, therefore, that the influence of Columba and his successors in the Abbacy of Iona, extended so widely over Ireland and Scotland, may we not with all fairness draw the inference—that the Irish and Scottish Gaels were thus brought very closely together; that as they owed allegiance to the same ecclesiastical superiors, their literature must have been largely identical; that the education which was given in the Irish and Scottish monasteries must have been very much the same; and that the Irish and Scottish Gaels were almost, if not in reality one people, having the same literature and speaking the same language?

That conclusion which seems to be legitimate enough, derives strength from the consideration, that the abbots of *Iona* who came after Columba, were many of them at least of Irish birth, were educated in Ireland, and held honourable and responsible positions in the Churches and Monasteries of that country before they succeeded to the Abbacy of Iona. The annals of Ireland record the names of forty-nine abbots or Coarbs of Iona, who exercised the functions of that office from 565 or 563, when Columba took possession of Iona, until 1198 or 1202, when the last abbot, *Giollacrist*, of whom any reliable account is given, wielded the power of abbot. A radical change passed about that time over the ecclesiastical and political affairs of Scotland; and with that change, the great supremacy of Iona ceased.

For more than six hundred years, abbots of Irish birth and education

bore sway in Iona, and contributed very largely towards making the Gaels of Ireland and Scotland, one in language, one in literature, and one in religious belief. In the Monasteries of Iona, Oransa, Archchattan, Uist, Melrose, etc., the Gaelic as well as the Latin language was cultivated. In Iona itself there must have been numerous MSS. of a very valuable character. So far as Scotland, however, is concerned, little or nothing of what must have been an extensive and valuable literature has escaped the ravages of the Scandinavians, and the spoliation of Edward I. in 1296, who with ruthless severity gave orders for the destruction of the records and all those monuments of antiquity which might preserve the memory of the independence of Scotland, and refute the English claims of superiority. To complete his task of literary vandalism, the same monarch subsequently ordered such records or histories as had escaped his former search—the MSS. of Iona doubtless among the rest—to be burnt or otherwise destroyed. Aikman, the translator of Buchanan's History of Scotland, remarks in the preface, "That he has the firm conviction that Buchanan had the use of records which now no longer exist." In foot-notes he also remarks: "I cannot refuse my belief to the assertion that Edward the I. did carry away a number of valuable records pertaining to this period—the loss of which is irretrievable. . . . It cannot be denied that Cromwell swept the country of whatever documents he thought of value. That Edward I. carried away the records of Scotland is allowed, that he preserved whatever suited his own purpose and that we have a list of them is also not denied. . . . What Cromwell carried off cannot be ascertained, but this much is known that several large hogsheads full of papers connected with Scottish history which had been carried out of the kingdom, were shipwrecked in the time of Charles II., in their passage from London to Scotland."

Eugene O'Curry remarks, "That we have three lives of St. Colum Cille written on vellum: one in Leabhar mor Dunâ Doighre, in the Royal Irish Academy; one in the Book of Lismore; and O'Donnell's great life of his patron saint and illustrious relative, now in the Bodleian Library at Oxford." Cuimine Ailbhe, or as Adamnan writes, Cummeneus Albus, who was the seventh abbot of Iona, 657-669, gathered into a small book the leading incidents in the life of Columba: De Virtutibus Sancti Columbae. Adamnan who was the ninth abbot, (679-704) wrote another life of St. Columba It is written in Latin and is divided into three books. Alcuin places Adamnan in the same category with the most eminent men of his nation.

Patricius, Cheranus, Scotorum gloria gentis,
Atque Columbanus Congallus, Adamnanus atque,
Praeclari patres Morum Vitaque Magistri.

The candid reader of Adamnan's life of Columba cannot receive as undeniable truth all the prophecies and miracles which he ascribes to Columba. Even the Apostles of Jesus Christ had no higher or stronger supernatural gifts than are continually assigned to Colum Cille by Adamnan. We must assign to the credulous spirit of that age much of what is marvellous in the work of Adamnan. In his preface to the third book, he adds that in the first book, he related some of the prophetic revelations which were made to Columba; that in the second book, he recorded the powerful miracles which the blessed man wrought; and that in the third book he will describe the apparition of angels which either Columba received regarding others, or others saw regarding him. That the tenor of Adamnan's life of Columba may be better understood, I shall make a few citations from it. As a specimen of the prophetic power of the Saint, his prophecy regarding the poet Cronan may be cited. "At another time, says Adamnan, as the Saint was sitting one day with the brothers beside Loch Cé (Lough Key in Roscommon) at the mouth of the river called in Latin Bos (Boyle), a certain Scottish Poet came to them, and when he had retired after a short interview, the brothers said to the Saint: Why didst thou not ask the Poet Cronan before he went away, to sing us a song with accompaniment according to the rules of his profession? the Saint replied, why do you even now utter such idle words? how could I ask that poor man to sing a song of joy who has now been murdered, and thus hastily has ended his days at the hands of his enemies? The Saint had no sooner said these words than immediately a man cried out from beyond the river. 'The poet who left you in safety a few minutes ago, has just now been met and put to death by his enemies.' Then all that were present wondered much and looked at one another in amazement." With regard to the miraculous power which St. Columba wielded, Adamnan writes, "Our belief in the miracles which we have recorded but which we did not ourselves see, is confirmed beyond doubt by the miracles of which we were eyewitnesses; for on three different occasions we saw unfavourable gales of wind changed into propitious breezes." As the account which Adamnan has given of the closing scenes in the life of Colum Cille has been very much admired, I shall make a few extracts from it. "In the end then of this same week, that is, on the day of the Sabbath, the venerable man and his pious attendant Diormit went to bless the barn which was near at hand. When the Saint had entered in and blessed it and two heaps of winnowed corn that were in it, he gave expression to his thanks in these words, saying: 'I heartily congratulate my beloved monks that this year also I am obliged to depart from you. You will have a sufficient supply for the year. This day in the Holy Scriptures is called the

Sabbath, which means rest, and this day is indeed a Sabbath to me; for it is the last day of my present laborious life, and in it I rest after the fatigues of my labours, and this night at midsummer, which commenceth the solemn Lord's Day, I shall according to the saying of Scripture, go the way of our fathers. For, already my Lord Jesus Christ deigneth to invite me, and to Him I say in the middle of this night shall I depart at His invitation, for so it hath been revealed to me by the Lord Himself." The attendant hearing those sad words began to weep bitterly, and the Saint endeavoured to console him as well as he could. Then leaving this spot, he ascended the hill that overlooketh the Monastery, and stood for some little time on its summit, and as he stood there with both hands uplifted, he blessed his monastery, saying: 'Small and mean though this place is, it shall be held in great and unusual honour, not only by Scottish kings and people, but also by the rulers of foreign and barbarous nations and by their subjects. The saints also of other Churches shall regard it with no common reverence.' After those words he descended the hill, and having returned to his Monastery sat in his hut, transcribing the Psalter, and coming to the verse of the 33rd Psalm, (English version 34th Psalm), where it is written: They that seek the Lord shall want no manner of thing that is good. 'Here,' said he, 'at the end of this page I must stop, and what follows let Baithue write.' Then as soon as the bell tolled at midnight, he rose hastily and went to the Church, and running more quickly than the rest he entered in alone, and knelt down in prayer beside the altar. At the same moment his attendant Diormit, who more closely followed him, saw from a distance that the whole interior of the Church was filled with a heavenly light in the direction of the Saint, and as he drew near to the door, the same light he had seen, and which was also seen by a few more of the brethren standing at a distance, quickly disappeared. Diormit, therefore, entering the Church cried out in a loud voice, 'Where art thou Father?' and feeling his way in the darkness, as the brethren had not yet brought in the lights, he found the Saint lying before the altar, and raising him up a little, he sat down beside him and laid his holy head in his bosom. Meanwhile, the rest of the monks ran in hastily in a body with their lights, and beholding their dying father burst into lamentations, and the Saint as we have been told by some who were present, even before his soul departed, opened wide his eyes and looked round him from side to side with a countenance full of wonderful joy and gladness, no doubt seeing the holy angels coming to meet him. Diormit then raised the holy right hand of the Saint that he might bless his assembled monks, and the venerable Father himself moved his right hand at the same time as well as he was able, that as he could not in words while his

soul was departing, he might at least by the motion of his hand, be seen to bless his brethren; and having given them his holy benediction in this way, he immediately breathed his last. After his soul had left the tabernacle of the body, his face still continued ruddy and brightened in a wonderful way by his vision of the angels, and that to such a degree that he had the appearance not so much of one dead as of one alive and sleeping. Meanwhile the whole Church resounded with loud lamentations of grief."

The very intimate relationship which obtained during many centuries between the Gaels of Scotland and the Gaels of Ireland, can be further exemplified by the prevalence of names of persons and places—names which were derived from prominent Irish Ecclesiastics who were wont to visit Scotland or to reside in that country.

From Calum comes Malcolm, *Maol*, a servant, and Calum, the servant of Columba.

MacCallum, MacGhille Chaluim, the son of the servant of Columba.

Paterson, MacGhille Phadruig, the son of the servant of Patrick.

MacLennan, MacGhille Fhinnein, the son of the servant of St. Finnan.

MacLellan, MacGhille Fhoalain, the son of the servant of St. Fillan.

MacMillan, MacMhaoilaon, the son of the little servant or of the bald one.

Very frequent in Argyllshire at least is the occurrence of names of Churches and parishes, and places which have an unmistakable connection with Irish ecclesiastical dignitaries.

If we begin at the south of Kintyre or at that portion of Argyllshire which is within easiest reach of Ireland, we shall find that Irish names are continuously present.

Sanda, Sancti Adamnani Cella: the Cell or Church of St. Adamnan. MacCulloch in his Highlands and western Isles of Scotland, observes that Sanda was a common station for the Scandinavian Fleets, during the contest so long ago carried on for the possession of Cantyre, and the neighbouring islands. The name *Avona* or *Avon* by which it was known is a corruption of the Danish *hafn*, a *haven*.

Kilellan, the cell or church of St. Fillan.

Killonan, the cell or church of St. Adamnan.

Kilkerran, the cell or church of St. Ciaran.

Kilchriost, the cell or church of Christ.

Kilkenzie, the cell or church of Cuineach or Coinneach.

Killean, the cell or church of St. John.

Kilcalmonell, the cell or church of Colum Cille.

Kilchoman, the cell or church of Caomhan.

Kilmartin, the cell or church of St. Martin.

Kilmichael, the cell or church of St. Michael.

Kilbride, the cell or church of St. Bridget.

Kilmory, the cell or church of Mary.

Kilfinnan, the cell or church of St. Finnan.

Kilmacolm, the cell or church of Calum Cille, is the name of a place near Port Glasgow.

Kirkholm, the kirk of Calum Cille, is the name of a place in the south of Scotland.

Inchcolm, the island of Calum Cille.

In addition to Iona, there were other islands in the neighbourhood which were under the immediate control of Columba and his successors. It is difficult to identify all the islands that are mentioned by Adamnan, owing to the difference between the Latin names which he gives to them, and the Gaelic names by which they are better known. On *Tiree*, a flat island west of Iona, there was a Monastery at *Magh Luinge*, or at the plain of the ship. Adamnan gives to Tiree the designation of *Insula ethica*. Various derivations have been assigned for the word *Tiree*. Some have maintained that the second Gaelic syllable *ithe* means island; and that therefore, *Tiree* means the land of the island; for there can be no doubt that the first syllable *tir*, signifies *land*. Others suppose that the second syllable stands for Aodha or Hugh, and that thus Tiree means the land of Hugh—an explanation which finds its counterpart in Tirhugh in Donegal. In consequence of its great flatness, Tiree has been styled Ruigheachd barr fo thuinn.

In the number of the Teachdaire Gaidhealach for January, 1831, there is a beautiful poem bearing the name Iul· an Eileanaich, and having reference to Tiree, and to the difficulty of seeing it from even a short distance when the storm is raging and darkness is on the deep. There is in Irish a word *ith*, which signifies corn. From *ith*, *ioth*, *eatha*, *etha*, Adamnan doubtless formed the adjective *ethica*, so that his name of Tiree *Insula ethica*, means the island of the corn, or the productive island, and that the correct explanation of Tiree is tir and ithe, the land ofth e corn.

The Topography of Iona furnishes an indissoluble link between the Gaelic of modern days and the Gaelic which Calum Cille and his monks and their successors were wont to speak.

It is only natural that the names of places should be subjected to an imperceptible process of polish and attrition, as the language to which they belong is undergoing development; because such words are in continual use and are modified according to the growth of language. There can be no greater difference between the names of places in Iona as they were wont to be pronounced by Calum Cille and his successors, and as they are pronounced by the modern Gael, than obtains between the robust and rugged verses of Chaucer, and the musical and polished rhythm of the poems of Tennyson. Among the topographical names of Iona are these:

Aird, height.

Am bealach mor, the large gap or opening.

Blar buidhe, the yellow plain.

Carnan buidhe, the yellow heap.

Carn cul ri Eirinn. The heap with its back to Ireland.

Carraig a' Chaolais, the rock of the straits.

Cladh an Diseart, the cemetery of the deserted place.

Cnoc an tobair, the hill of the well.

Cnoc na h-analach, the hill of the breath, the steep hill.

Dusgeir, the black rock.

Eilean nan con, the island of the dogs.

Fang Mhaolain, the enclosure of the brow of the hill.

Goirtean Tomhair, the field of protection.

Iomaire nan righ, the ridge of the kings.

Loch Staonaig, the loch of the juniper berry.

Cnoc Odhrain, the hill of Odhran.

Reilig Odhrain, the burying-place of Odhran.

Port a' churraich, the harbor of the Coracle.

Maol nan uan, the bare place of the lambs.

Sron Iolaire, the eagle's nose.

Sruth a' mhuillinn, the stream of the mill.

Tigh an Easbuig, the Bishop's house.

Tobar na h-aoise, the well of age.

Uamh an t-seididh, the cave of blowing.

Uamh nan calman, the cave of pigeons.

Uamh na Caisg, the cave of Easter.

An uiridh riomhach, the splendid bed.

According to Adamnan, Columba was much devoted to writing. Three Latin Hymns are attributed to him. In the Burgundian Library at Brussels, there is a collection of some fifteen poems which bear his name. In the Bodleian Library at Oxford, there is a manuscript which it is said, "embraces everything in the shape of Poem or fragment that could be called Columba's, and that industry was able to gather together at the middle of the sixteenth century." A collection bearing the name, The Prophecies of St. Columb'Kille, was published in Dublin in 1856. Competent scholars, like Eugene O'Curry, strongly maintain that many of the poems which bear the name of Colum Cille are forgeries, and are on grounds of internal evidence to be assigned to a comparatively modern date. The Altus Prosator—Hominum Sator atque Deorum—is the name of a celebrated poem or hymn, which was written by St. Columba in Iona in honor of the Trinity, when the messengers of Pope Gregory came to him with the great cross and other presents. A careful edition of the *Altus* has been published by Dr. Todd, one of the best Irish scholars of our time.

In Leabhar na h-Uidhri, a copy of which is in my possession, Amra Colum Cille or the elegy of the poet Dallan Forgaill on the death of St. Columba, is contained. There is also a poem of eight verses which is attributed to St. Columba himself. It begins with the words, Dia ard airlethhar, May the High God advise us.

The Gaels of Scotland are familiar with the sayings which have been assigned to St. Columba regarding women. "Far am bi bo, bithidh bean, agus far am bi bean, bithidh mallachadh. Where a cow will be, there will be a woman, and where a woman will be, there will be cursing." It is said that Columba compelled the workmen, who were employed by him in the erection of various buildings in Iona, to reside on the shore of Mull, that the female members of their families might not come to Iona.

His well known prophecy with regard to the future fortunes of Iona has been thus happily paraphrased:

An I mo chridhe, I mo ghraidh,
An aite guth manaich, bithidh geum ba,

Ach mun tig an saoghal gu crioch,
Bithidh I mar a bha.

O sacred dome and my beloved abode!
Whose walls now echo to the praise of God;
The time shall come when lauding monks shall cease,
And howling herds here occupy their place.
But better ages shall hereafter come,
And praise re-echo in the sacred dome.

Tradition has it that forty-eight Scottish kings, four Irish monarchs and eight Norwegian princes were interred in Iona, and that so marked a preference for Iona as a place of interment was the result of this prophecy of Columba.

Seachd bliadhna roimh 'n bhrath,
Thig muir, thar Eirinn re aon trath;
'S thar Ile ghuirm ghlais,
Ach snamhaidh I Cholum clairich.

Seven years before that awful day
When time shall be no more,
A watery deluge shall o'ersweep,
Hibernia's mossy shore.
The green clad Islay too shall sink,
Whilst with the great and good,
Columba's happy isle shall rear
Her towers above the flood.

DÉNÉ ROOTS.

BY THE REV. FATHER A. G. MORICE, O.M.I.

(Read 21st November, 1891.)

I.—INTRODUCTION.

Comparative Philology considered as a distinct science cannot boast of a very ancient origin. As late as a hundred years ago, it was still in its infancy. Of course the study of languages for the sake of philological deductions had been prosecuted long before with varying success. As far back as A.D. 1563, Pigafetta, the naive chronicler of Magellan's discoveries, enriched his narrative with three vocabularies of foreign tongues*, and his example was followed by some later navigators. Missionaries also walked in his footsteps, though they generally paid more attention to texts than to words, some of them concentrating their efforts towards the collecting of the Lord's Prayer in as many languages as possible. Yet it is to Leibnitz that we must look for the first author of repute who applied himself to the systematic study of foreign tongues with a view of deducing therefrom ethnological conclusions. "Je trouve," he says in a letter to Father Verjus,† "que rien ne sert d'avantage à juger des connexions des peuples que les langues. Par exemple, la langue des Abyssins nous fait connaitre qu'ils sont une colonie d'Arabes." Lacroze‡ and Reland,§ his followers in the same scientific field, pursued their studies animated by a like spirit and reached similar conclusions.

However, it was not until the reign of Catherine II. of Russia that Comparative Philology began to assume a separate and concrete form. That monarch drew out a list of one hundred Russian words and had them translated in as many languages as possible. She soon discovered unexpected affinities, and with her own hand drew up comparative tables. About the same time, Dom Pezron, a learned Benedictine, showed by numerous examples that many words of the Greek language have a Celtic origin. "Vous serez surpris," he wrote to a friend," "quand je vous dirai que j'ai environ sept ou huit cents mots

* Navigationi e Viaggi raccolti già M. Gio. Bat. Ramusio, Ven. 1563.

† G. Leibnitii opera omnia, edit. Dut. Vol. VI., Part II., p. 227.

‡ Commerc. Epistol. tom III., p. 79, Leips. 1742.

§ *Ubi suprà*, p. 78.

Grecs, je dis de simples racines, qui sont tirés de la langue des Celtes, avec presque tous les nombres. Par example, les Celtes disent *dec*, dix, et les Grecs δέκα. Les Celtes disent *pemp*, cinq, et les anciens Grecs Eoliens πεμπέ. Les Celtes disent *pedwar* ou *petoar*, quatre, et les Eoliens πέτορές. Les Celtes disent *undec*, ouze ; *ddoudec*, douze, etc. Les Grecs, εδνέκα, δο·έκα, etc. Jugez du reste par cet échantillon."* Another pioneer in the Comparative-philological field, Col. Vans Kennedy, wrote a work wherein he quotes nine hundred words common to Sanskrit and other idioms. Lastly, in the early years of this century, the German Francis Bopp, in his *Das Conjugationssystem*, instituted a comparison between the grammatical systems of Sanskrit, Greek, Latin, Persian and German which won for him the title of founder of Comparative Philology.

The paramount importance of such studies is evident, inasmuch as even those scholars who deny the common origin of the human race allow that identity or similarity of language between nations however distant cannot be the result of mere chance, but proves some real connection of origin or early relationship. Nor have believers in the original unity of mankind ever failed to perceive it. "It is then," says Abel Rémusat, "we should be able to pronounce with decision what, according to the language of a people, was its origin, what the nations with which it has stood in relations, what the character of those relations was to the stock it belongs to."†

These researches which brought forth such valuable ethnological and archæological results in connection with peoples, as the European and most of the Asiatic nations, whose historical data are embodied in well authenticated records, cannot fail to prove at least as useful relatively to such races as the American tribes which have no other history than a few vague and disconnected legends and traditions. Nay, it might almost be said that Comparative Philology is in their case the only beacon which can throw any light upon their origin, their migrations and their connection with the other branches of the human family. Unless, of course, we choose to believe in their autochthony and thereby reject the only authority upon which we can depend as upon an unerring guide, I mean the inspired Books. For, as there is on our planet but one species of man, and as the Bible furnishes us with only one Genesis, it follows that, unless we regard the American continent as the cradle of the human race—which I think nobody is prepared to do—we must look to the old world for the birth place of our Aborigines.

---

*Encyclopedie ou Dictionnaire universel raisonné, art. Celtes.

†Recherches sur les Langues Tartares, Vol. I., p. XXIX.

And let nobody say that, because the American facies and physique in general are somewhat different from those of the nations of Europe and Asia, we must conclude to a diversity of origin as well as of race. Have we not in our own Indo-European family types more dissimilar than those which characterize the American and some Asiatic races? Surely nobody will deny that a North American Aborigine is physically more alike to a Samoyed or a Mongolian than the inhabitants of the Indian peninsula resemble either a German or a Greek*. Even in such ethnological subdivisions as the Celtic and the Italic, we find notable differences of type and complexion. Yet nobody ever dreamt of considering, for instance, the Irish or the Saxons, and the French or the Italians as the products of two distinct creations.

The question then for the Christian ethnographer is: Since we cannot regard the American tribes as autochthonous, in what part of the old world are we to find their parents or relatives? Many have been the answers to that query, and the opinions of Americanists have been so varied and contradictory that the student is fairly puzzled as to whichis the most plausible. Grotius, de Laet, Garcia and others discussed it in their days with more learning than judgment. To Brerewood, Korn, Jefferson, Charlevoix, Buffon and Cuvier, the red skins were nothing else than expatriated Mongolians or Scyths. Foster even designated the Tartar emperor Kublai-Khan as the virtual colonizer of the New World. Mitchell made the North American Indians regular Samoyeds. During the last century and early in this, a number of writers, treating many primitive usages of mankind as particularly Jewish, endeavoured to prove that the Americans were descended from one of the twelve tribes.

But, without disregarding what there might be of truth in any of these conflicting theories, it must be confessed that sociology is of itself utterly unequal to the task of solving such a problem. Comparative Philology, alone of all the kindred sciences, can claim the right and ability to do so. It was thus understood by the judicious Reland who may be regarded as one of the first to collect from travellers specimens of American languages.† Later on, Smith Barton made considerable progress in the attempt to compare words in the American dialects with terms found among the nations of Northern and Eastern Asia. "In 83 languages examined by Barton and Vater, 170 words have been found the roots of which appear to be the same; three-fifths resemble the

* The facial similarities of the Mongolians and some American natives are so striking that I know of persons who mistook in my presence British Columbia Indians for Chinese.

†De linguis Americanis, Traject. 1708.

Mantchou, the Tongouse, the Mongul and the Samoyed."* I do not speak of more recent and better known Americanists such as Gallatin, Humboldt, Schoolcraft, Gibbs and a host of others—without mentioning those who are still living—whose researches and judicious studies have illustrated American science. All of them concur in the opinion that the most infallible sign of the congenerousness of two Indian tribes is the similarity of their speech.

What Smith Barton did for the Iroquoian, Siouan, Muskogean and other languages may, I think, be repeated in favour of the Athabaskan or Dénê idioms. Or indeed it may be that our own efforts will simply be the continuation of what he commenced himself; for I am not aware of the nature of all the dialects he examined. Be it as it may, his move being certainly a step in the right direction, I beg to enrol myself as one of his humble followers. I live in the midst of Indians who belong to an Aboriginal family roaming over thousands of miles in the North West of British America. In that immense expanse of country we find many congenerous tribes which cannot understand each other, and yet from the territory of the Loucheux of Northern Alaska to the plains bordering on the Chilcotin river in Southern British Columbia, words expressive of those primaries of Indian life such as beaver, bear, canoe, and of the objects of simplest import as water, fire, stone, etc., are singularly similar when not altogether identical.

This almost perfect homonymy has ever struck me as a circumstance of the utmost importance to the ethnologist. For if we are to discover in any corner of the globe races connected with our Dénés by direct or parallel descent from a common stock, it seems to me that it must be through the medium of these fixed, immutable and probably very ancient root words. And I dare hope that this assumption will bear the most rigid criticism. For were we to suppose for an instant that, owing to some impossible cataclysm, we are suddenly deprived of the least historical records relating to the civilized nations, how could we, for example, reconstitute the ethnological map of Europe otherwise than with the help of the roots of the languages spoken by its inhabitants? In like manner, had not the roots of the liturgical Coptic tongue been identical with the Egyptian of the Pharaohs of old, the key to those mysterious hieroglyphics which for centuries puzzled generations of savants would still be sought after. The basis for comparison failing, no practical result could have been obtained.

Therefore, instead of presumptuously building up hasty theories before

*Al. von Humboldt, Views of the Cordilleras, Vol. I.

we have amassed and impartially collated reliable data, as Abel Rémusat accuses some writers of doing,* I take the liberty of laying before the scientific world the following list of roots extracted from the vocabulary of a dozen or more Déné tribes. May I be permitted to respectfully request lovers of philological and ethnological lore to examine them patiently, and most earnestly beg of those who are in a position to do so, to carefully compare them with terms of Asiatic languages, more especially with those of the Turanian stock? Should any Déné words be found to have sufficient phonetic similarity to synonymous terms from heterogeneous tongues to allow of ethnological argument, I would consider it a very great favor if the discoverer of such affinities were pleased to send me† or the Canadian Institute the result of his researches.

I am well aware that terminology is not of itself what entirely constitutes a language. We must reckon also with its grammar and syntax But, in the first place, I have already given an outline of the grammatical aspect of the Déné idioms‡ which my kind co-operators might consult perhaps to advantage. Then we should not lose sight of the following words of a great authority on the subject: "It appears that nothing whatever could be inferred with respect to the relations of two languages from the coincidence of the sense of any single word in both of them, and that the odds would be three to one against the agreement of two words; but if three words appear to be identical, it would be then more than ten to one that they must be derived in both cases from some parent language or introduced in some other manner. Six words would give more than 1,700 chances to one, and eight almost 100,000 chances; so that in these cases the evidence would be little short of absolute certainty."§ Moreover, some instances seem to warrant us in maintaining that under the pressure of peculiar influences a language may undergo such alterations as that its words shall belong to one class and its grammar to another. In other words, though the grammatical structure of the Déné dialects differs from that of other idioms wherewith they are terminologically co-affin, it would not follow that the relations to the latter would be philologically worthless.

This being premised, I shall now proceed to offer a few remarks to facilitate the intelligence of the following vocabulary and bring out into

---

* "Ici comme ailleurs, on a commencé par batir des systèmes au lieu de se borner à l'observation des faits." Recherches sur les Langues Tartares, Paris, 1820, p. xviii.

† Stuart's Lake Mission, *via* Ashcroft and Quesnelle, British Columbia.

‡ Transactions Canadian Institute Vol. I., Part II., 1891, p. 170.

§ Alex. von Humboldt, ap. Klaproth, Asia polyglotta, p. vi.

greater relief the similarity or even identity of the root words which compose it.

1. One great principle of the Dené phonetics which should never be lost sight of is that in those dialects, as in the ancient Semitic tongues, the vowels are transmutable, and therefore, except in a very few cases, no importance whatever should be attached to them. To still better illustrate this peculiarity, I have gone to the trouble of writing down after each separate set of synonyms the real root (marked RR.) which lies at the bottom of each of them. Had I crowded said lists with all the roots which I had at my disposal, the evidence of this principle would have been still more apparent. Initial consonants, that is those which begin *any* syllable, contain the quintessence of the word, sometimes in common with the final consonant which, however, may be said to have but a relative importance.

2. Of the radical consonants, some are interchangeable in any single dialect through the whole linguistic stock to such an extent that they are not differentiated by the natives of any tribe. To this class belong B and P, T and D, K and G, T[and K[or 'Kl. A Dené ear perceives no difference whatever between, for instance *pés* and *bés*, "knife;" *ta* and *da*, "lip;" *ku* and *gu*, "worm;" *t'la* and *k'la*, "bottom." Such is not the case with transmutable consonants of the second class. These are invariable within the vocabulary of the dialect which they characterize, but change from tribe to tribe. Pronounce, for example in the presence of a Carrier Indian the word *Na-'kra-ztli-'ten* and he will at once understand you as saying in his own idiom, "people of Na'kraztli" or Stuart's Lake. Change it now into *Na-'kra-ztli-'qîn*. He will still understand you, but will remark that you now speak in a different dialect and if he is at all acquainted with the idiom of the Sikanais, he will recognize that word as belonging to it. Radical consonants of this class are *'t* which is convertible into *'q; t's*, into *'kw* and *'q; ts* into *kw*, *kfw* and *tc*. In a few cases, initial *n* is also convertible into *y*, and small bands of Rocky Mountain Dénés as well as the large tribe of the Loucheux or Ku-tchin* likewise change the original *p* common to all the dialects into a regular *v* which is proper to themselves. Therefore the phonetic difference between such words as *ətsi*, *ekfwi* and *itci* is more apparent than real. They are all the monosyllable *tsi* modified by the phonology of the Hare and a few other tribes into *kfwi*, while the Loucheux change the *ts* into its co-relative *tc* and say *itci*.

3. As for the initial vowels *ə*, *e*, *i*, to which we should add the prefixes

*Pronounce, *kut-'qin*.

hwo, *ko*, *kwo*, etc., they are meaningless accretions which, strictly speaking, are not component parts of the words and which should be treated as if they did not exist. They are proper to a few nouns expressing objects of simple import among which we must count the names of the different parts of an animal body. When the words refer to a human being their prefixes are changed into *ne*, *ni*; *ti*, *tîn*, *téy*, etc., according to the dialects, and they disappear altogether when said nouns are preceded by another word forming therewith compound nouns, as *'kre-'tan*, "birch-leaf," instead of *'kre-ətan*.

4. Of non-initial consonants, *z* is sometimes converted into *w* and *v*, while the first *t* in quite a number of monosyllables is changed into *r*. *Apropos* of *z*, I should remark here that in such works as *et'quze*, "vein," *e'tuze*, "skin," etc., that letter should not be considered as initial relatively to the last syllable of the word, the final *e* being a mere accretion characteristic of certain dialects. The real words are *'quz* and *'tuz*. Thus pronounced they will be understood by most of the tribes.

5. As for the value of the letters with reference to the sense of the words, a close examination of the following vocabulary will disclose the fact that, in all the dialects, connection with water is expressed by an initial *th*: *thu*, water; *thiɹ*, bottom of the water; *tha-tsi*, wave, etc. Besides, a *t* suffixed to certain nouns or pronouns adds to their original meaning that of reference to place.* For instance, in Carrier, *thu* means "in the water," when we suffix a *t* thereto (*thut*); *e*, "it" becomes "at it," that is, "there" with the same addition. *Ayu*, "another (thing)" Tcilkohtin, signifies "at another place," i. e., "elsewhere" when changed into *əyut*. *s* and *z* in a similar position denote derivation *from* the place expressed by the word to which they are suffixed. Ex.: *nto*, "above"; *ntəs*, "from above"; *nu*, "*in* the direction of the head of the water"; *nuz*, "*from* the same direction," etc. For more detailed remarks concerning the value of letters in Dené, I take the liberty to refer the reader to my paper on "The Dené Languages."

6. The main, and generally only, root of the verbs contained in the following vocabulary, is to be found in their last syllable which, in a number of cases, is subject to radical variations. This applies also to the adjectives which, with barely two or three exceptions, are regular verbs. I give the verbs in the first person singular of the indicative present—there is no infinitive—and the adjectives in the third person of the same mode tense and number.

---

* A final *h* performs the same function in relation with some nouns. Ex.: *ta-thi*, "doorway"; *ta-thih*, "in the doorway."

7. The capital letters within parentheses denote the particular tribe to which the preceding root belongs. Here is a list of all the tribes quoted in the vocabulary together with their habitat :—

ABBREV.	TRIBE.	HABITAT.
A.L.	Alaskan Loucheux	Alaska.
B.	Beavers	Peace River east side of the Rockies.
Bab.	Babines	Babine Lake & "Rocher Déboulé," B.C.
B.L.	Bastard Loucheux	Northern McKenzie District.
C.	Carriers	Stuart's Lake, North and South, B.C.
Ch.	Chi[khoh'tins	Chilcotin River, B.C.
D.R.	Dog Ribs	Between Gt. Slave & Gt. Bear Lakes.
H.	Hares	McKenzie, Anderson, McFarlane Rivs.
L.	Loucheux or Kut-chins	MacKenzie River, 67° and northwards.
L.C.	Lower Carriers	South of Stuart's Lake, B.C.
M.	Montagnais or Chipewayans	Lake Athabaska, etc.
N.	Navajos	Arizona and New Mexico, U.S.A.
Na.	Nah'anés	Stickeen River and east.
R.M.	Rocky Mountain "Montagnards"	Rocky Mountains, about 60° N.
S.	Sékanais	R. Mountains from 54° to 57° W. and E.
V.L.	Variety of Loucheux	MacKenzie River and Alaska.
Y.K.	Yellow Knives	North East of Gt. Slave Lake.

Various other less important tribes are also represented without credit through several words of the vocabulary. My principal aim in introducing the above initial capitals in the vocabulary is, in most cases, to point out the wonderful homophony which reigns between dialects of tribes separated sometimes by thousands of miles.

8. All the words proper to the Eastern dialects are extracted from Petitot's *Dictionnaire de la Langue Déné-Dindjié.** For the sake of uniformity I have taken the liberty to re-spell them according to the requirements of my own orthography. For most of the Navajo terms I am under obligation to Dr. W. Matthews' "Mountain Chant," published in a late volume emanating from the Smithsonian Institution.† Shall I confess in this connection that the irregularity of some radical and, in *all* the other dialects, unchangeable consonants entering into the composition of those words would lead me to suspect that such delicate, but very important, sounds as t's, 'k, [, may possibly have escaped the notice of the compiler? Those and many other terms in the said Mountain Chant are, in other respects, so similar to synonyms from the Northern Déné dialects as to hardly leave me any other way of explaining away the discrepancies between, for instance, the Navajo roots Nos. 3, 76, 84, 185 and 327 and their equivalents in the other dialects. If I

*Paris, Ernest Leroux Editeur, 1876.

†Vth Annual Report of the Bureau of Ethnology, p. 379.

am mistaken in my assumption, these alterations of essential consonant sounds afford the comparative philologist data well worth some moments of study.

9. As for the phonetic value of letters, it is as follows:—The vowels are pronounced as in Italian except *ə*, which is equivalent to the *e* in the French words *je, te, le, me; é* corresponds to the vowel in the French "mets;" *è* to the *e* of English "ten." Phonetic accents (*â, ê, ô, û*) as in French. The consonants have generally the English sound except the following:—*g* is always hard; *j* is sounded as in French; ɣ, ɹ are very guttural; *ɻ* is a peculiarly sibilant l; *ñ* is nasal, but its sound is usually ollowed by that of a common *n*.* *Q* almost corresponds to *ty*, both etters being consonant and simultaneously pronounced. *R* is the result of uvular vibrations and in such compounds as *kr, ɣr, 'kr*, it is hardly audible. *Th, kh*, are equivalent to *T plus h* and *k plus h*. The apostrophe before certain consonants represents the Indian exploding sound. *C* is the English *sh*: *tc* is the English *ch* in church. There are two principal dipthongs: *au* and *ai*, pronounced respectively as the *ow* of "how" and the *i* of "mire."

10. Initial or terminal *ɻ* is changed into *l* or *'ll* when the word is in the possessive case, and initial *ɹ* likewise becomes *r* in the possessive.

II.—VOCABULARY.

1 **Man** (homo) .....Dénė, dinè, danè, dunè, denu, təne (C), təni (Ch), tana (N), dunyé (Esp.); dindjyé (L.) tey in compos.=RR.: d-n-, t-n-

2 **Man** (vir).....dènè-yu (M.), dènè-ju (S.), dènè-yi (B.); dene-liñè (H.): dindjyé-yu and Tikrèñ (L.); təyosz (Ch.)=RR.: y-, j-; tiñ-

3 **Woman** .....T'sè-khè, t'sè-khu, t'sè-kwi (M.), t'sé-ndjô (L.); t'sè-liñè (H.); t'sô (A.L. and S.); Tci-ké? (N.); ekhué (R.M.) =RR.: t's-k-

4 **Child** .....ʒskhe (L.C.) 'eskhèɹ (Bab.), eskha (B.), êkhé (H.), ekyé (D.R.): t'sûtən (C.), t'siñto, t'sidoñé (B.); t'siya and t'siñén (L.); a-cike (N.)=RR.: -skh-; t's-t-n

5 **Young man** (juvenis) .....Tciɻ plur. Tcilkhe (C.), tcéɻ plur. tcélekhe (Ch.), tcilekwi (M.) tsilké (N.) tstcia (L.)=RR.: tc-lk.

6 **Girl** (puella) .....'Têt plur. 'têdəkhô (C.), 'tyede (A.L.) 'téré (D.R.), e't'te (B.), e't'tedu (S.), e't'tede-kwi (M.), e't'tede-khe; t'se-liñ (S.)=RR.: 't-t

7 **Father** .....ʒtha, thyéñ (L.), theni (V.L.); əpa (C.), əpép (Bab.)=RR.: -th-; -p-

8 **Mother** .....ʒɹañ, əɹoñ; emañ, emoñ; enañ (R.M.(. əpan (Ch.); 'ellu. (C.)=RR.: - -ñ; .p-n; -llu.

---

*In Tciɻkhoh'tin, *ñ* is the equivalent of the French nasal *n* in such words as *entends, sein, son*

9 **Son** (said by mother) .....ɜyaz, eyaze, yaji (N.), eja (S.), eyañ (H.), ezaze (D.R.); ikhi (L.);=RR. -ya-

10 **Son** (said by father).....əyé, eyésse, ezile (Y.K.); etcune (H.); izjyow (L.)=RR.: -y-; -ch-n-

11 **Daughter** (said by mother) ..əya-t'sé (*i.e.* "little one—feminine) (C.), et'sôa (Na.), yet'si (L.), et'sale (V.L.); ethue (H.), ithiñ (L.); əlan (A.L.); =RR.: y-t's-; -t's-; -th-

12 **Daughter** (said by father) ..ətsé, tzoe=RR.:-ts.or-tz.

13 **Grandfather**.....ətsiyan, etsiyé, etséé, itsi (L.); asse (B.)=RR.: -ts-y-

14 **Grandmother** .....ətsu, etsun, etsune, etsuneta (B.); assun, esson (L.)=RR.: -tsu-; -ssun

15 **Grandchild** .....ətcai, etcéy (L.), etca-aze (M.), etcaze (B.); ekfwie (H.), ekfuë (B.L,)=RR.: -tca-; -kfw-

16 **Brother** (elder) .....ûnâ (C.), nai (N.), unare (M.), oñre (Bab), uñ larè (S.); gûntye (H.), iyondè (L.)=RR.: un-; yunt-

17 **Brother** (younger)..... ətcəl, ətcél, etcéle, etcile; tsili (N.)=R.R.: tc-l-

18 **Sister** (elder) .....are, tare, etare: əyat, edji (L.); enba (S.)=RR.: -are.

19 **Sister** (younger)..... .... ətiz (Ch.), edéze (M.), etyéze, etieé, edjyéz (L.), ətis (C.)= RR.: -t-z-

20 **Uncle** (maternal) .....əz·é, e·è, e·éñ, o·i (L.), er·é=RR.: -·-

21 **Uncle** (paternal).....əthai, ethi (L.), ethiyi (L.), estha (S.)=RR.: -th-

PARTS OF THE BODY.*

22 **Head** *.....ətsi, ekfwi, itci (L.)=RR.: -tsi and co-transmutables.

23 **Hair** (fr. "poils").....əra, era, əre.=RR.: -r-

24 **Hair** (fr. cheveux) .....ətsi-ra, ekfwi-ra, etci-re=RR.: the above two combined.

25 **Face**.....iñne, iñni, iñen; ñan (A.L.), nîn (C. and Ch.).=RR.: ñ-n

26 **Mouth**.....əzé, eza, ca (M.), fwa (H.), ewa, fa (R.M.), zat (A.L.), cet (L.)=RR.: -g- and commutables.

27 **Teeth** ....əru, ərwo.=RR.: -ru and rô

28 **Lips** .....əta, eda'nne (M. and H.), ite-va'(L.), ite-va-die (L.)=RR.: -t-

29 **Tongue**.....etsu (M.), ətsol (Ch.), ətsulla (C.), etsuri (B.), itca (L.)= RR.: -ts-

30 **Eyes**.....əna, ine (L. in compos.), enare (M.); eta (S.), woda, enda, ənde (L.)=RR.: n-; t-, -t-

31 **Ears**.....ətzo (C.), edzi (L.), edzie (H.), edzare (M.), wodzare (S.)= RR.: -dz-

32 **Drum of Ears** .....ətzé (C.), edzi (H.), idzi (L.), edzie (M),=RR. -dz-

33 **Neck** ....e'kroc, ə'kwəc (Ch.), e'ko.=RR.: -'k-

34 **Arms**.....ekone, ekîn, ekun, əkran (C.), əkan (A.L.)=RR.: -k-n

35 **Elbows**.....etsé, etso, etséz, etsuze.=RR.: -ts-z

36 **Hands** ....lla, əlla, iñlla, ənlle (L.)=RR.: -ll-

37 **Fingers** ... .əlla-t'sən, iñlla-'kwene, iñlla-t'sale.=RR.: hands-bones

38 **Finger-nails**.....əkre (C.), əkai (L.), əkrən (Ch.), ekrane (M.), ekone (H.)= RR.: -kr-or-k-. Follows always the word "hands": əlla-kre

39 **Legs**.....edzare, idzjiedi (L.); ət'sən, et'séne, e'kwene.=RR.: -dz-; -t's- and commutables. ɜt'sən and following words mean "bone." The Carriers say khé-tcən, "feet-stick," or "-handle."

*See Remark 3, Introduction.

40 **Knees** ..... əkwət (C.), əkwot (L.), əkot (A.L.), eko (H.), ekor (M. and Y.K.)=RR.: -k-t

41 **Feet** ..... əkhe, əkré=RR.: -khé. The accent is here, by exception, necessary to differentiate that word from the term used by some tribes to say "husband."

42 **Sole** ..... khé-t'la, khé-'kla, kré-'klén (L.)=RR.: "Feet-bottom."

43 **Breasts** ..... ət'sû, et'sə ; 'tagu (L.)=RR. -t'sû or t'sô ; 't-

44 **Milk** ..... t'sû, t'sûe, tsû-ge (B.), e'tə-thu ("breasts-water," H.) RR.: same as above.

45 **Belly and Womb** ..... etcañ, ətcan, etcoñ, etstciet (L.)=RR.: -tc-n

46 **Abdomen** ..... əpət, ebət, ebər, epə (H.), enbə (S), evət (L.)=RR.: -p-t

47 **Heart** ..... ətsî, edzjî, edzéé, edziye ; kidzjan (A.L.)=RR.: -dz-

48 **Kidneys** ..... etse, etseze, etsəgə (L.); ene-tcai (R.M.)=RR.: -ts.

49 **Liver** ..... əzət, azət (L.), ezər (M.); ewət (H.), kowo (D.R.)=RR.: -z-t

50 **Lungs** ..... ətəs, ətis, ətize, etewé, ətoyo (L.) ; efuñ (R.M.)=RR.: -t- -

51 **Entrails** ..... et'siye, et'sîg.=RR.: -t's.

52 **Back** ..... ənèn (Ch.), ennene (M.), iñnene (H.), ənnan (L.) ; e'taziñ, e'ta-ne, ən'tien ; əyən (C.)=RR.: -n-n : -'t-

53 "**Tergum**" ..... ət'la, e'kla, e'klé=RR.: -t'l-

INTERNAL PARTS OF THE BODY AND ACCIDENTS THERETO.

54 **Corpse** ..... əzi (C.), ezie (M.), ejigə (L.), əzik (L.C.) ; ewie (H.) ; etciñe (L.)=R.R.: -zi and commutables, the "i" being always retained.

55 **Flesh, Meat** ..... t'sén, t'séñ, kfwéñ (H.), ətsəñg (C.), ətsi (Bab.)=RR.: ts-n

56 **Bone** ..... t'sén, e'kwéne (H.), t'sən (C. and L.)=RR.: t's-n

57 **Fat** (solid) ..... ə'krâ, e'kra, e'kré.=RR.: -'kr-

58 **Fat** ..... ɹe (C.), ɹéi (L.), ere ; k'lés, 'klé.=RR.: ɹe ; 'kl-

59 **Blood** ..... tél, ta (L.) eté, etéle.=RR.: t-l. The Carriers say əzkhrai

60 **Vein** ..... ət'qûz, et'qûze (M.), et'quwe (H.), et'qoñ (L.)=RR. -'q.-

61 **Muscle** ..... t'sé, 'kwé, 'qé, et'ségе.=RR. t'sé and commutable consonants.

62 **Skin** ..... ezəz, ewé, evə, ezow (L.) evé (S.)=RR. -z- and commut.

63 **Skin** (fine, as of fruits, etc.) ..'tuz, 'tus, 'tu, 'tis, e'tuze.=RR.: 'tu and a sibilant.

64 **Excrement** ..... tsañ, tseñ, tsoñ, tsyeñ)L.)=RR.: ts-ñ

65 **Urine** ..... ɭéz, ɭé, ɭəz (C.), ɭazj (L.)=RR. ɭ-z.

66 **Pus** ..... ɹəz (C.), ɹaw (L.), ɹéz, ɹewi (H.)=RR.: ɹ-z. Possess rəz, etc.

67 **Boil** ..... t'sés, t'səs, t'sé, t'sə.=RR.: t's-s

68 **Scar, cicatrice** ..... ɹaz, ɹazi ; ɣa (C.)=RR.: ɹ-z and ɣ-. Possess., raz, etc.

69 **Scab** ..... ɭut, ɭur (M), kolled (H.), elludé ; néyview (L.)=RR. ɭ-t.

THE EARTH AND CONCOMITANTS.

70 **Earth** ..... nni, nne, nna, nnu, nən (L.), nèn (Ch.), nan ; yən (C.)=RR.. nn- or -nn

71 **Earth** (dust, etc.) ..... ɭéz, ɭiz, ɭie, ɭe.=RR.: ɭz.

72 **Country** (pays) ..... néne, nan, nən ; dye ; khé-yər (C.), kri-yé (M.)=RR.: n-n, etc.

73 **Land** ..... sai, séi, cai, ca, fwa, fa (R.M.)=RR.: s-

74 **Stone** ..... tsé, tci, tco (L.), kfwé, fwé.=RR.: ts-

75 **Mountain** (wooded) ..... céc, cəs, cyé, ci, ciw.=RR.: c-

76 **Mountain** (steep and rocky)..tzəɬ (C.), dsil (N.)=RR.: tz-ɬ
77 **Summit** .....ta, tig, tare ; la, lla, llé, lleñi.=RR.: t-; ll-
78 **Grass** (hay).....t'lo, 'klo, 'klôr,.=RR.: t'lo
79 **Prairie** .....t'lo-'kət, 'klo-'ké, 'klô-dye, 'klow-tizjə (L.), 'klo-néné (M.)= RR.: "grass-on" and "grass-country."
80 **Road**.. .....thi (C.), théñ (Ch.), thaeñ (L.), thuñ-lu (M.), tiñ-lu (Y.K.); ghé (H.),=RR. th-
81 **End** .....la, lla, llé, lañ, lloñi, luñ (B.)=RR.: Same as "Hands," 36.
82 **Middle** .....niz, nize, nie ; nitig (L.)=RR.: ni-
83 **Edge** .....pa (C.), pè (Bab.), pañne (Y.K.), bañne (M.), véñ (L.); e'ka (H.); winañ ; meñ (D.R.)=R. p-, -k-

LAND ANIMALS.

84 **Dog** .....ɭi, ɭin, ɭiñ, t'leñ kli? (N.); possess. s. lək, sə llik, se lline -ɭin, etc.=RR.: ɭi. These words are used in connection with all domestic animals.
85 **Wolf** .....yés, yəs, zjow (L) ; nûn (Ch.), nunniye ; tika (R.M.), tikai (H.)=RR.: y-s, nûn ; tik-
86 **Lynx** .....noñta, nûntî (Ch.), nidzjin (L.); tcize (M.), tcere (B.L.)= RR.: n-nt-; tc-z.
87 **Bear** (black) .....sas, cac (N.), s'əs, sa, sié.=RR.: s-s
88 **Caribou** .....hwotzih (C.), pətzih (Ch.), medzi (S.), mindzi (R.M.); thañ- dzjye (M.)=RR.; -tzi
89 **Moose** .....dəni, denié, denii, tendi, dendjig (L.), tenni (R.M.)=RR.: d-n-
90 **Beaver** .....tsa, tsé, tsi, tso, tsu.=RR.: ts-
91 **Rabbit** .....gha, gho, kha, kho, khé, khəɹ.=RR.: kh-
92 **Porcupine** .....t'si (M.), t'sit (L.); 'quñe (H.), 'qâh (Ch.), tet'que (B.)=R R.: t'si ; 'q-
93 **Squirrel** (sciurus Alpinus)...g'lie, k'lie, k'lik, k'lag, k'le, k'loye.=RR. k'l-
94 **Mouse**.....tlûn, tlune, gluñé, klu, klo (L.)=RR.: tlu-
95 **Worm**.....gu, ku, kyoñ (L.), əsku (C.)=RR.: ku

WATER AND CONCOMITANTS.

96 **Water**.....thû, thô (Ch. and N.), thyoñ (L.); in compos. tha, thé=RR. th-
97 **Water** (bottom of).....thèɹ, thère, thèe, thè=RR.: thè
98 **Water** (surface of).....tha-ɻra, thi-ɻra (D.R.), thu-ɻrare ; tha-taë=RR.: ɻra-, "surface.")
99 **Current** .....'niliñ, nileñ, nilini (N.), nînli (C.)=RR.: ni-l- These words are as many verbs meaning "it flows."
100 **Cascade** .....nainliñ, nainli, na-deinlin (H), na-deñleñ (L.)=RR. na-nli. These words are also verbs meaning "it falls down while flowing."
101 **Foam** .....əɹwos, oɹwos, koɹo (H. and L.)=RR.: -ɹ-o
102 **Eddy** .....'o (C.), o'e (D.R.), orneé (M.), oghe (H.), ogho (L.)=RR.: o
103 **Wave** .....tha-tsi "water head" (C.) ; tha-dethiñe (M.), tha-detco (H.), thie-ditcig (L.)=RR.: tha-
104 **Shore** .....tha-pa, tha-bañne, tha-pañre, tha-ma (B.L.), the-veñ (L.)= RR.: "Water-Edge."
105 **Beach** .....ɭan, tlañ, 'klane, kllen (L.)=RR.: l-n

106 **Bay** .....t'ləɪ (C.), 'kla-zeñ (M.), 'kllen (L.)=RR.: t'l-, root of the words for No. 53.
107 **End of Lake**.....Tha-t'la, théy-t'let, tha-t'let=RR.: "Water-bottom."
108 **Island**.....nu, nnu, ndu, ndju and ndow (L.); tu.=RR.: nu.
109 **Ice** (on water).....thèn, thən (C. and A.L.), than (L.), thène (B)=RR.: th-n
110 **Ice** (floating or in pieces) ....ɪu, ɪut ɪəm (C.); kwollu (Ch.), kollu (D.R.)=RR.: ɪ-; -ollu

WATER ANIMALS (FISHES).

111 **Fish**.....ɪue, ɪuge ɪugu, ɪoh (C.), ɪuk (L.C.)=RR.: ɪu-
112 **White fish**.....ɪu, ɪo, ɪuge-wa (H.), ɪugu.=RR.: ɪu
113 **Salmon** .....tha-llo, tha-llok.=RR.: "Water-fish."
114 **Eggs and Fry** .....ə'kûn (C.), e'kin (L.), e'kûne, e'krune.=RR.: 'kûn
115 **Fish bone**.....ərai (C.), era (H.), erwosse (M.)=RR.: -r-

SKY, CONCOMITANTS AND DERIVATIVES.

116 **Sky** ....ya, jya (S.), jà, zjyé (L.); in compos. yé, yi, yu=RR.: y-*
117 **Sky** (without clouds).....ya-zañ, ya-zoñ, jya-zañ, ya-zai, zjyé-zjin.=RR.: "sky-bare."
118 **Clouds**.....'kwos, 'kwəs, 'kwroc, 'kro=RR.: 'k-
119 **Sun** . ...sa, sye (L.)=RR.: s-
120 **Moon** .....Same as above, and eldzî, îldzîn (L.C.), adzi (S.), adzie (H.), adzji.=RR.: -dzi. Many tribes say also "night-its-sun."
121 **Star**..... .....sən (Ch. and L.) sèn, cèn (M.), ſwèñ (H.), fèñ (R.M.), səm (C.)=RR.: s-n
122 **Rain**..... .....tcan, tcoñ, tcyèn (L.)=RR.: tc-n
123 **Snow** .....yəs, yac (M.) jyah (H.), jah (S), zjyow (L.)=RR.: y- -
124 **Snow** (crusted by winds in the t'siɪ, t'si=RR.: t'si-. When it is hardened by the cold of spring.) ..... the nights, not by the wind, it is said
125 **Snow** (hardened.) .....ollu, kollu, kullu.=RR.: -llu
126 **"Gresil" "frimas."** .....so, sor, kôzo, kozjo.=RR.: sibilant-
127 **Hail**.....iñllu, iñllue, enllu, anllu, kiñllu (A.L.)=RR.: -nllu
128 **Fog** ....'a, 'ha, 'hèg; tséɪ, tsə.=RR.: '-: ts-
129 **Wind** .....nîɪt'si, nîñt'si, at'sey (L.)=RR.: -t'si

BIRDS AND CO-RELATIVES.

130 **Bird**..... .....de't'tañi, de'toñi, tə'tañ (old C.), tə'tai (modern C.), RR.: t-'t- from 'ta, "feather;" means "the feathered ones."
131 **Feather** .....'ta, 'té (L.)=RR.: 't-
132 **Feather Down**. .....tciwc, tciéc, tcéz, tcus, tcow; t'səz (C.)=RR.: tc and a sibilant; t's-z
133 **Wings**.. .....et'séne (M.), int'séne, -a -t'sən (L.), 'ta- t'sən (C.)=RR.: -t's-n
134 **Tail** ....etcé, ətcé, etstci (L.), tsé (N.)=RR. -tcé. The é being characteristic.
135 **Egg** .....ɹez, əɹez, əreze, arwo (L.)=RR.: ɹ-z
136 **Nest** ....'to, 'tô, 'tôr=RR. 'to. "Bill" is said as "Lip."

SPECIES OF BIRDS.

137 **Raven** .....'ta-tsañ, 'ta-tsoñ, 'té-tsieñ=RR. "Feathers-dung."

* Same word in all the dialects for "louse," the intonation determining the sense.

138 **Crow** (small) .....'ta-tsañ-tsəl, ta-tsan-tséle, etc. Same words as above with the diminutives tsèl, tsəl, tséle
139 **Wild Goose** (A. Canadensis.)ɹa, ɹé, réy, ɹəɹ, =RR.: ɹ-
140 **Gull** (L. eburneus).....pîs-'krai, pes-'kraye, pə-'kra (H.), və-'ké (L.), RR.: p- 'kr.
141 **Crane** ....teɭ, tiɭ, tiele, tele ; djya (L.)=RR. t-ɭ ; the final e in tiele ; tele is instrumental in changing the radical ɭ into l.
142 **Loon** (C. articus) .....tha-tzî, tha-dzéne, tha-dzjeñ (L.)
143 **Fly** (common).....t'suz, t'soz, t'sô, əst'səz (C.) ; taïn (L.)=RR.: t's-z
144 **Mosquitoe**.....t'seh, t'sih, 'qi (L.), 'kwi (H.), det'qule (Y.K.)=RR.: t's- and commutables

FIRE AND CONCOMITANTS.

145 **Fire** .....kron, krun (B.), krwon (C. and L.)=RR.: kr-n
146 **Smoke**.....ɭér, ɭat (L.). ɭət (A.L. and C.), ɭe. =RR.: ɭ-t
147 **Coals** .....'tés, 'tie (H.), 'te (R.M.), 'to (L.)=RR.: 't-
Ashes ....is translated by "Dust" in all the dialects.
148 **Fire-wood** .....tséz, tsəz, tsé (H.), tsow (L.)=RR., ts-z

WOOD AND CONCOMITANTS.

149 **Wood** ....de-tcèn, tə-tcən, tciñ (H.), tcran and tə-tcran (L.)=RR.: tc-n. "Də" and "de" is strictly speaking no real root. These particles simply refer to the length of the stick.
150 **Bark** .....'tuz, etc. as "skin."—of spruce to cover houses, etc., əlla
151 **Branch** .....'kwé (H.), cow (L.) Is more generally rendered by the two following
152 **Leaf**.....e'tan, a't'tañ, iñ'tañ, iñ'toñ. =RR.: 't-n
153 **Leaf** (of coniferous) .....'əl, 'el ; 'el-kare, tila-kare (H.), tila-ko (D.R.)=RR.: '-l
154 **Thorn** ....ɹwəs, ɹwos, ɹo, ko-ɹo. =RR.: ɹ-
155 **Root**.....rai, ray, re, əreh=RR.: re
156 **Gum**..... ...dzé, dzéh. =RR.: dzé
157 **Fruit**.....djiyé, djie, djèg ; mai (C.), nez'tan (Ch.)=RR.: dj-
158 **Bush** .....t'sel, t'səl, t'sele ; ko-t'sele (H.), ko-t'səl (L.)=RR.: t's-l

TREES.

159 **Spruce** (A. alba) .....t'sû, t'si (R.M.), t'səvi (L.)=RR.: t's-
160 **Birch** ....'kri, 'kre, 'kek (A.L.)=RR.: 'kr-
161 **Willow**.....'krai, 'kraye (H.)=RR.: as above.
162 Fr. Can. "**Liard**"..... 'taze (M.), 'tewi (H.), 'taw (L.), 'tesh (A.L.)='t-z
164 **Service berry** .. ..'krin-djiyé, 'ki-djeg (L.), 'kren-mai (C.)=RR.: 'kr-n
165 **Service berry-tree** .....'krin-tcène, 'ki-tcran (L.), 'kren-tcən (C.)=RR.: preceding with "stick."
166 **Raspberry**.....da-krale, tañ-kral, ta-krare (D.R.)=RR.: t-kra-

HABITATIONS.

167 **House** .....yé, zjé, yi, yəɹ ; khoñ, khuñe, khuni=RR,: y-: kh-ñ
168 **Den** ....'an, 'on, 'añr, 'añre, 'oñi. =RR.: '-n
169 **Lodge** (beaver) .....ekhin, ekrin, əkren (C. and L.)=RR.: -k-n
170 **Dam** (beaver) .....'eɭ, 'əɭ, 'eh ; t'sia (L.)=RR.: '-ɭ

WEARING APPAREL.

171 **Head-gear** .....t'səɹ (C.), t'sé (L.), t'sor (A.L.), t'sa-krale (M.)=RR.: t's-
172 **Blanket** .....t'sère, t'séde (L.), t'səte (A.L.), t'sət (C.); naɭ'ti (L.C.)=RR.: t'ş-t
173 **Belt** .....sé, cé, ſwé (H.), cəw (L.), cəz (M,)=RR.: sibilant-
174 **Coat** .....·i, ·ie, ·ig.=RR.: ·i
175 **Breech cloth**.....tsan, fwoñ (H.), ekfwone.=RR.: ts-n
176 **Leggings** .....ceɭ, cəɭ, fwé (H.), possess. (se) zele (se) wewe (H.)=RR.: sibil.-
177 **Mocassins**.....khé, kré, kie, khé-skwət (C.)=RR.: same as "foot," 41.
178 **Mittens**.....djis, tcis (Y.K.), djéèc (L.); pa, pat, pare. RR.: dj-s; p-
179 **Snow-shoes**.....·ai, ·aih, ·a, ·ey.=RR.: ·ai diphthong.

IMPLEMENTS.

180 **Canoe**.....t'si, t'su (H.), t'sé (D.R.); ella (Slave and Sék.)=RR.: t's-; -lla
181 **Paddle**.....'toc: 'tôh, 'to, 'qoc (C.)=RR,: 'to
182 **Knife**.....bés, bié, bé: ɭəzthih (C.); əthés (L.C.)=RR.: b-
183 **Axe**.....tséñɭ, kokfwiñ (H.), tsé-tsiɭ (C.), té ·éñ (L.)=RR.: ts-ɭ
184 **Iron**.....tsañ-tsəne, sa-tsoñne, sa-tsoñ (R.M.); iñtsi (L.); ɭəzthih (C.)=RR.: "beaver-dung" and "bear-dung."
185 **Arrow**.....'kra, 'kroñ. 'kiñ, 'kie (L.), ka (?) (N.)=RR.: 'kr-
186 **Quiver**.....'krañc, 'kras, 'kroñ, 'ki-ja (L.)=RR.: "Arrow," and a sibilant indicating "room for, place of."
187 **War club**.....ɹaɭ, ɹəɭ, ɹa (H. and L.); possess. rale=RR.: ɹ-ɭ. Possess. ral, etc., ɹ aud ɭ being changed into r, l.
188 **Snare**.....piɭ, biɭ; mi; via (L.)=RR.: piɭ.
189 **Vessel** (any small deep recipient).....theɭ, thiɭ. theli, thiañ (L.) RR.: th-ɭ
190 **Kettle** (anything to put on the fire).....oñca, ôsa, uñsa, oñfwa (H.)=RR.: -osa. The C. formerly said: nôsai
191 **Plate** (or any flat vessel) ....t'sai, t'sak (Bab.) 'qék (L.), 'kwa (H.)=RR.: t's-
192 **Rope**.....t'luɭ, t'lule, t'lu (H.), tlla (L.), tloll (A.L.)=RR.: t'lu
193 **Handle**.....tcən, tcéne, tcine, tcran (L.)=RR.: same as that of "Wood."
194 **Handle** (long).....thî (C.), thîn-tcèn (Ch.), thin-tcine (H.), thaeñ (L.)=RR.: th-
195 **Edge** (of cutting tool).....'kra, 'ka (S.), 'kyé (L.)=RR.: Same as that of "Arrow" (185).
196 **Fishing Hook**.....qəc (C.), qéc (Y.K.), djyèc (M.)=RR.: q-c-.
197 **Hook** (large).....səɹ, saɹ, san, so: sə; zaɭ (M.)=RR.: s-
198 **Bow**.....eɭthin, aɭthèn (L.), iñthiñ, əɭthi (modern C.)=RR.: ɭ-th-
199 **Walking stick**.....thəz, théz, thaz, théh (H.)=RR.: th-z

ABSTRACT NOUNS.

200 **Day** (from morn till eve) ....tzîn, dzin, dzjîn (L.), dzîne (M.)=RR.: dzîn
201 **Night**.....thəz, thaz (L.), théze, théwe (H.)=RR.: th-z
202 **Midnight**.....thəz-niz, théze-nize, thaz-itlədé (L.)=RR.: Same as in English, the order being reversed ("night-mid").
203 **Daily** recurrence of obscurity ɹəɭ, ɹiɭ, ɹa, ɹe=RR.: ɹ
204 **Sleep**.....peɭ, pəɭ, beɭ, pə (H.), vah (L.)=RR.: p-ɭ
205 **Mind, thought, cares** ....ni, inni; kojya, kwi-zjye.=RR.: ni; k-jy-
206 **Spirit; double self**.....tsîn, tsîne: eyuñne (M.)=RR.: tsîn

207 **Smile** .....tlô, klô, dlô, dlor, tloh.=RR.: tlô
208 **Weeping**.....tsâ, tsar, tsé, tsié.=RR.: ts-
209 **Song**.....cèn, cən, ciñ ; possess. se-yèn, ci-gin (N.) ; ellik (L.)= RR.: c-n-
210 **Whistling** .....yuyuz (C.), yulyiñz (M.), yuzjyo (L), uyiñ (H.)=RR.: -uy-
211 **Breath**.....əyiz, eyie, eyu. =RR-: -y-
212 **Old age**.....cąñ, ciñ, cioñ (H.), sañ, (N.), qañ (C.)=RR.: -an
213 **Famine** .....tan, tañ, dañ, toñ, doñ, tuñ, tai (C.)=RR.: -t-n
214 **Disease, plague** .....tata ; llae (H.), t'sik (L.)=ta ; l- - ; t's-
215 **Cough** .....krwəs, kroc, khro.=RR.: k-
216 **"Essoufflement"**.....cih, ci.=RR.: ci
217 **Shame**.....uya, yuya, ozjyé (L.)=uy-
218 **Name** .....iñzi, ûzi (C.), ûzji (L.), rôzi (Ch.)= -zi
219 **Half**.....'kəz, 'kéz, 'kew (H.)='k-z
220 **Month**.....Is rendered by "sun" and : sa-nən, sa-ni, sa-ne (V.M.), siénan=RR.: "sun-duration" or "moon-duration or season."
221 **Season**.....nén, nən, nan, méñ=RR.: n-n
222 **Winter** .....ɹe, ɹai, ɹey, ɹaye, ɹhare, ɹet.=RR,: ɹ-. All the tribes also say, yac-'ké, yəs-'kət, etc. "Snow-on."
223 **Summer** .....tan, atonle, tañ-grən (C.)=RR.: t-n
224 **Summer** (first or early).....cin (C. and L.), cine (H.), sine (M.)=RR.: c-n
225 **Ursa major** (constellation) ..yeta, yita (D.R.), yéc-ta (M.), yéh-tai (Ch.)=RR.: y-t-. *Ursa minor* is rendered by the same words followed by the diminutives tsél, tsəl : yaz, etc.

ADJECTIVES.*

226 **Good ; nice,** etc.....ne-zuñ, ne-ziñ, ne-zoñ (R.M.), ni-zjiñ (L.), n-zu (C.)=RR.: zu
227 **Long** .....el-nez, ne-nez ne-nəz (Ch.), nin-djiw (L.); en-tew*=RR.: -z. The C. say n-yiz.
228 **Short** .....e-tue, iñ-tue, nən-tî (Ch.), n-tuk (C.)=RR.: t-
229 **Heavy**.....ne-taz, nən-taz (Ch.), n-taz (C.), nen-ta (B.L.), ni-tije (L.) =RR.: ʃt-
230 **Light** .....nən-tzai (Ch.), ni-tzik (L.), n-tzak (L.C.), n-tza (C.), ne-zare (M.)=RR.: tz-
231 **Thick** .....des-thi, de-thi, tə-thai, tidi-thiñ.=RR.: th-
232 **Thin**.....t'sə'tan, t'se'tañne, t'se'tale (M.); iñ'toñne, RR.: 'tan from ə'tan "leaf."
233 **Flat** ("épaté") .....de-kraɻ, tə-kraɻ, inde-krale (H.), déy-kaɻ (L.)=RR.: kraɻ
234 **Big, great** ... .ne-tca, iñ-tco (R.M.), eñ-tcai (V.M.), nən-tcâ (Ch.), niñtcyé (L.), n-tcä (C.)=RR.: tc.
235 **Small** .....nən-tsul (Ch.), n-tsul (C.), n-tsol (L.C.), tsula (M.), otséle (M.), iñ-tséle (H.), kwen-tsél (L.)=RR.: ts- and a labial.
236 **Warm** ... .ne-zəl, ne-zéli (M.), ni-zu (L.), fwe-wele (H.)=RR.: z-l and commutables with z.
237 **Cold**.....nîn-'kraz, nî-'kraz, nez-'kraz, we-'kra (H.), zey-'kraz (L.) ; ellu (M.), we-klu (H.), elluze (H.), eklu (L.)=RR.: 'kraz ; -lu
238 **Wet**.....səl-tsél, ol-tsél, nil-tséli, we-tsél, nal-tsa (L.)=RR.: tsél

*See Introduction, remark 6.

239 **Moist** ..... nal-zor, te-zo, éll-zjo (L.)=RR.: zo
240 **Red** ....de-téle (H.), tél-tel (Ch.); di-t'si, di-t'sig (L.); təl-'kən (C.) =RR.: tél, "blood"; t'si, "vermillion"; kron, "fire."
241 **Grey** ....təl-pa, del-paye, kote-pa (H.), tco-péze=RR.: pa
242 **Grey** (hair) .....dél-kray (M.), təl-krey (C.), de-kay (H.), da-kay (L.), de-krali (S.)=RR.: kray
243 **Yellow** .....dél-tsor, təl-tso, de-kfwoy (H.), zə-tsow (L.) RR-: tso
244 **Rancid** .....ez-tsoy, re-tsor (S.), ye-kfrwo (H.), zə-tsow (L.),RR.: tso
245 **Prickly** .....dé-t'sé, səɬ-t'si (C.), tenîn-t'sa (H.), tinîn-t'sik (L.), səɬ-t'sik (L-C.)=RR.: t'si.
246 **Precious, dear** .....tiz-thî, der-thî, de-thi.=RR.: thî. Hence təne-thî, mutih-thî, "man-precious," old-man; "chief-precious," big chief. The C. of 100 years ago said thəñ instead of thî.
247 **Muddy** (water) .....dzañ, dzin, dzoñ.=RR.: dz-n
248 **Numerous** .....ɬañ, ɬan, ɬoñ, eñtloñ, kiñɬeñ (L.), ɬai (C.),=RR.: ɬ-
249 **Raw** (meat).. ....'teè, e'te, et'qe.=RR.: 'te
250 **Green** (wood) .....təllin, dellin, detlin, təlli, atlow (L.)=RR-: -lli. The syllables "tə, de" indicate that the adject. qualifies an elongated object.
251 **Naked** .....în'tit (Ch-), əs'tet (C.), iñl'teri (M.), iñ'tieri.=RR.: 't-t. These words are genuine non-verbal adjectives.*

VERBS.

252 **To be** ....esli, əstli, el'i îl'i, nəstli (Ch.), əstləñ (old C.)=RR.: -lı. This verb is used only in connection with nouns and two or three real adjectives.
253 **To be sitting down** .....səsta, seta, cita, wita, zidie (L.)=RR.: -ta. Plural t'si; dual kré
254 **To be lying down** .....səsthi, sethi, nesthi, nethi, nitci (L.)=RR.: thi, plural thés. Applies only to living animals.
255 **To be lying down** .....səɬthi, celthi RR.: same as above. Applies to *lifeless* animals and their empty skins.
256 **To be lying down** .....One single object with no striking characteristic=RR.: -.ai, 'añ
257 **To be lying down** .....Several non-particularized objects=RR.: -tla, la
258 **To be lying down** .....Soft as linen, tanned skins, etc.=RR.: -tcuz
259 **To be lying down** .....Granulous as sand, salt, etc.=RR.: -tzai
260 **To be lying down** .....Long as wood, etc.=RR.: -than
261 **To be lying down** ..... Round (but single)=RR.: n-'ai, n-'añ
262 **To be lying down** .....Liquid=RR.: -tzéh
263 **To be lying down** ..... .Coagulated=RR.: -tɬé
264 **To be lying down** .....In an uncovered recipient=RR.: -kraih, etc., etc., etc.
265 **To be standing up** .....səcyin, seyin, cîyin.=RR.: -yin
266 **To sing** ....ésqèn, əsqən, eeqiñ (H.)=RR. -qèn and cèn "song."
267 **To weep** ....éstsar (M.), etsé (H.), itsé (L.), əssâ 2nd pers. întsâ (C. and Ch.)=RR.: -tsâ
268 **To Laugh** .....əstloh (C.), na-stlôr (M.), eklo (H.), itla (L.)=RR.: -tlo
269 **To cough** .....təsɮwəs, deskroc, tekro (H.)=RR.: t-ɮwəs
270 **To say** .....déssi, désni, tiño (L.)=RR.: d-i

*I omit such adjectives as "fat" "frozen," etc., because the root of their equivalent in Dené is the sam as the words "fat" and "ice" which I have given among the nouns.

271 **To ask**.....utəskrət (C.), odeɭkrat (L.), uteké (H.), ureskər (M.)=RR.: ut-k-

272 **To think**.....(opinari) yenescèn (M.), yenészən (Ch.), yenîcèn (L.), nəszən (C.)=RR.: n (from "ni" mind) -z-n

273 **To see**.....es·î, e·î, əs·en=RR.: -·î, 1st conj.

274 **To snore**.....əsrô (C.), ésroñ (Ch.), deroñ (H.), esros (M.), éɭrwok (L.) =RR.: -ro

275 **To Burn**.....təs'krən, dés'kran, de'koñ, tîɭ'ki=RR.: -'k-

276 **To kiss**.....ést'sun, et'su, na-d-əst'suz (C.), neɭ-t'sun (L.)=RR.: -t'su

277 **To tear**.....təs'qéɭ, dés'qél ; de'kla (H.)=RR.: -'q-l

278 **To make** (v. tr.).....(construct, fabricate) aslé (M.), aslèɪ (Ch.), əstle (C.), aɭ·e (H.), 'tîl·è (L.)=RR.: -le

279 **To make** (v. tr.).....so and so, to cause a change in an object already existing, éstsi, essi, əssih=RR·: -tsi

280 **To do**.....əs·in, as·i, a·i=RR.: -i, 2nd conjug.

281 **To blow out**.....əs'qul, és'qul, e'qô (H.), it'séy (L.)=RR.: 'qul

282 **To smell** (v. intr.).....etsin, etsèn, aɭtsən=RR.: -ts-n

283 **To go out**.....thé-nəcya (C.), thi-néssai (M.), thi-na-déca. = RR.: thi from "door" and "walk.

284 **To prick** v. intr.).....élt'si, wet'si, əlt'sik, səɭtsik, səlt'si=RR.: t'si

285 **To fry**.....əs'tés, és'téc=RR.: -'tés, "coals."

286 **To steal**.....ənəs-î (Ch.), enes·i (M.), ene·i(H.),eni-î, (L.)=RR.: n-·i

287 **To fall down**.....na-zt'sət, na-st'sər, elt'sət (L.), na-dekwé (H.)=RR.: na (*i.e.* relation to the soil (ni) and -t'sət, expressive of the locomotion of a single object

288 **To kill** (many pers-).....əsran, esran, eskran, ekun (H.), iran (L.)=RR.: -ran and convertible kan

289 **To cut** (with axe).....əsseɭ 2nd pers. în-tseɭ, destseɭ, dêkfwin=RR,: -tseɭ, "axe."

290 **To cut** (with scissors) ... ..əs'tas, és'tac=RR.: -'tas

291 **To grease** (friction).....əstɭə (C.), eltɭar (A.L.), eskɭar (M.), ekɭé (H.), aɭkɭé (L.), estɭar (Slaves)=RR.: -tɭ-

292 **To deceive**.....nəs·a, nes·a, ne·a, ni·é=RR.: n-·a

293 **To mistake** (make a) .....nes'ta, nîs'ta, nê'ta=RR.: n-'ta

294 **To command**.....əs·a, es·a, e·a, âɭ·é=RR.: -·a

295 **To take** (v. tr.).....əstcût, éstco, etcu=RR.: -tcu

296 **To hold**..... usthən, usthun, uthon, uɭthan=RR-: uth-n

297 **To teach**.....hwonəsthan, unesthan, unetheñ, uneɭthan = R.R.: un-th-n

398 **To be afraid**.....nəzqèt (C.), nesqéd (H.), neɭqét (L.), nesqér (M.)=RR.: n-.qét

299 **To hide**.....na-nes·i, na-ene·i, ne-niɭ·i=RR.: -·i

300 **To loosen**.....'ké nas·ək, 'ké nae·a, berañ nes·ar, 'ké ney·at=RR.: n-·-

301 **To be daylight**..... .....yəɭkrai, yelkrañ, yekrañ, neɭkrèn=RR.: -kr

302 **To count**.....ustho, ustha, udetha (H.)=RR.: -u-th-

303 **To exist, there is**.....hunli (C.), uñli (M.), guñli (H.), goñli (Ch.), koñli (L.) = RR.: unli

304 **To swim**.....əspiɭ (C.), espeɭ (M.), epie (H.)=RR.: -pi

PRONOUNS.

305 **I**, Fr. "moi".....si (M. C. L. Bab. &c.), sit (Ch.), seni (H.=RR.: s-

306 **Thou**, Fr. "toi".....nan (L.), nèn (M.), nîn (Ch.), nyən (C.), neni (H.B.)=RR.: n-n

307 **It**, Fr. "lui, elle".....(non-human) e (C.), ey (L.), yèy (B.), eye (Ch.), eyi (M-H.) =RR.: e

308 **He, she,** Fr. "lui, elle" ....(human) èn (C.), éyèn (Ch.), edîni (M.), etîni (Y.K.), edetan (L.), edeteni (H.)=RR.: e (3rd pers.) and n (from dene, təne, etc., "man.")

309 **We,** Fr. "nous autres" .....nɹôn (Ch.), nuɹwun (L.), nuni (M.), nakheni (H.), hwèni (C.)=RR.: same as

310 **You,** Fr. "vous autres".. . ɹôn (Ch.), nuɹwun (L.), nnûni (M.), nakheni (H.), nuhni (C.)=RR.: n-n

311 **They,** Fr. "eux, elles"..... enè (C.), éyène (M. Ch.); ekhedetan (L.), ekhedeteni (H.) =RR.: same as that of "he, she," plus : ne (sign of plural) or khe (sign of plural).

312 **This** .....ntî (C.), dji (L.), diri (M.), didi, dedi, teri, tiri=RR.: tî

313 **That**.....nyu (C.), eyi (M.), etc., as "It." RR.: y-

314 **What?** (in compos.).....ta (C., Ch., H., L., Bab.), té (L.): etla (M.)=RR.: t-

315 **What?** (with a noun).....tî (C.), ttcidi (L.)=RR.: same above (314).

316 **My** .....s, sə, se, si, ci (N.)=RR.: s

317 **Thy** .....n, nə, ne, ni (N.), nyə, nye (C.)=RR.: n

318 **His, its** .....p, pə, pe, be, bi (N.), və (L.), vi; u (C.), hwo (C.) =RR.: p, u

319 **His** (third pers.) .....y, yə, ye, yi (N.); we (D.R.)=RR.: y

320 **His** (reflective) .....t, tə, te, ti, ta, de=RR.: t

321 **Our** .....nu (M.), ne (C.), uɹo (Ch.), nurwe (L.), nakhe (H.)=RR.: n-

322 **Your**..... .....nuh (C.), nohwe (C.); other dialects as above (321).

323 **Their**.....ube (M.), ope, opə (L.C.); ku (Ch., B., H., L.), ko (L.)=up; ku.

INVARIABLE WORDS, CONJUNCTIONS, POSTPOSITIONS, ADVERBS, ETC.

324 **If, when** (future non-interrog.)de, te, ènde, nide, anide, dji (L.)=RR.: te. Is a postposition.

325 **Lest**..... .. ..'qa, in all the dialects, except in (L.), 'qeñ=RR.: 'q- Postposition.

326 **In** (side).....yé (M.), yo, yi (N.); pît (C.)=RR.: y- Postposition.

327 **On** .....'kət (C.), 'ké (M., H., C.), ki (?) (N.), 'kie (D.R.), 'krage (L.)=RR.: 'k- Postposition.

328 **Amidst**..... .....tha (M.H.), thèt (L.), thəɹ (without movement), thəz (with mov.) (C.)=RR.: th- Postpositions.

329 **With** . .....pəɬ, peɬ; yeɬ, etc. Nos. 316 to 323 with ɬ added to the pron. Postposition.

330 **Without**.....éd (C.), edèn (Ch.), ediñ (M.), etiñ (H.), etèñ (D.R.), atan (L.)=RR.: -t- Postp.

331 **In the middle** .....niz, nize, djizə (L.)=RR.: -iz

332 **For, owing to** (me, etc.)....(s)a (M.. H., Ch., etc.), (s)iét (L.), (s)pa (C.)=RR.: except in C. it consists simply in the vowel *a* added to the RR. of the pronouns. Postp.

333 **To** (marks direction) .....t'sèn, t'sən=RR.: t's-n. Postp.

334 **Close to** (me, etc.) .....ran, rén, ron, roh, rə, rane=RR.: r-. Postp.

335 **By the side of**..... ... .zih, zire, zige, zégə=RR.: zi- Postp.

CONJUNCTIONS AND ADVERBS.

340 **And, also** ....tca, tci, tco, tcu, tcrañ, tciñ=RR.: tc-

341 **However** .....khulu, kholu, khuli (all initial); kan'te, kwalan'te, kulan'te (final)=RR.: kh-l-; k-'te

342 **Far** .....neza (L.C.), niza (M.). nizjéd (L.), nirwa (H.), inzath (N.), niɬtza· (C.)=RR.: n-z-

343 **Farther** .....(yu)·ən, (yu)·az, etc.; (oñ) ·ən, (oñ)·az, etc.=RR.: The hiatus preceded by the complement and followed by the postposition.

344 **Well** (in compos).....sa, sañ, se, siè, sô, su=RR.: s and a vowel sound
345 **Badly** (in compos).....tza, tzəɹ, dza; tsé, tsa. tsen=RR.: tz or t and any sibilant.
346 **Above**.....yetare (M.), yutare (M.), yetagə (L.), yatige (B.), yateye (D.R.), yuto (C.), yutih (Ch.), yetək (L.C.)=RR.: -t- The syllables yu, ye, ya, are merely to give the adverb an additional meaning untranslatable in English. They can be replaced by several other particularizing particles.
347 **Below**.....yuyo (C.), yayək (L.C.), yayaɹ (Ch.), yaye (M.), yayure (D.R.), yuyuro (A.L.), etc-=RR.: -y- Same remark as at No. 346.
348 **Here**.....djyañ (M.), djyuñ (H.), djun (B), djyèn (L.), nqan (C.), nənqan (Ch.)=RR.: dj-n or its equivalent (even phonetically) q-n.
349 **There**.....Eyèr (M.), éyét (Ch.), eyédi (B. H.); zjig (L.)=RR.: No. 307 with localizing consonant t or r.
350 **Knowingly** and **spitefully**.aoniɻe (M. C.), auniɻ (L.C.), awenile=RR.: diphth. au-niɻ

WORD FORMATIVE ELEMENTS.

351 **Reduplication, mark of**..na in all the dialects and N., except in L. and B., nè. RR. =n-
352 **Reciprocity**.....ɻ, ɻe, əɻ, éɻ; ñi (L.)=RR.: ɻ; ñi
353 **Reflection**.....ede, ədə, etə, atə=RR.: -t-
354 **Rejection**.....'ən, 'añ, 'oñne=RR.: ' with a nasal sound.
355 **Relation to water**.....tha in all the dialects except in L.: thé.=RR.: th- 96.
356 **Relation to the fire**.....tsé, tsiye, tci, kfwi.=RR.: ts-and
357 **Relation to the soil**.....ni, ne=RR. 70.
358 **Amplificative**.....tco, tcâ, tcor, tcore, tstcyé=RR.: same as No. 234.
359 **Diminutive**.....yaz, yaze, aze; tsəl, tsél, tsćle.=RR.: same as No. 9 and No. 235.

NUMERALS.

360 **One** (thing).....iñɻare (M.), inɻagé (H.), inɻèg (L.), iɻo (C.), itɻi (Ch.), ɻ'kre (L.C.)=RR.: -ɻ-
361 **Two** (things).....nakhe (M.), nañkhe (C.), nakrèñ (L.), nañkhô (L.C.), oñkhe (H.), nèɹk (Bab.)=RR.: na, "again" and khe "feet."
362 **Three** (things).....thare (M.), thage (H.), thake (L.C.), thièg (L.), tha (C.), thai (Ch.)=RR.: th-
363 **Four** (things).....dîñri (M.), dîñyi (H.), tînqi (Bab.), təñge (C.), tankre and tan (L.), tîñ (Ch.)=RR.: t-ñ
364 **Five** (things).....əskoñla (L.C.), əskoñlai (Ch.), kwollai (C.), sê-sunlare (M.); lla-'ke (H.)=RR.: -k-lla; and "hand -on."
365 **Six** (things).....éɻ'ke-thare (M.), éɻ'kə-thai (Ch.), ɻkə-tha (C.); et'sèn-thage (H.), etsé-thédji.=RR.: "mutually-on-three," *i.e.*, "on both it is three."
366 **Eight**.....éɻ'ke-dîñri (M.), ɻ'kə-təñge (C.), etc., RR.: same formation as 365. The other numbers are not roots.
367 **First**.....tsé (M. and Bab.), ekfwé (H.), tci (L.); ət'qan (Ch.); tcu (C.)=RR.: ts-: 'q-n
368 **Yes!**.....a (C.) and a 'a, héñ (M.), hénhén (S.H.), haha (L.), iñ 'iñ (Ch.)=RR.: a vowel.
369 **No!**.....to (L.C.), tu, du (H.), taudi, taodi; akrwa (L.): awəntuh (C.)=RR.: t-
370 **Take this!**.....na' (C.,Ch.), na (L.), nañ (M.), noñ (H.)=RR.: n-

NOTE ON OCEAN STEAM NAVIGATION.

By Sandford Fleming, LL.D., C.M.G., Etc.

(Read 17th December, 1892.)

I ask your permission to offer some remarks on a subject which cannot fail to command the attention of the members of the Institute.

We are all familiar with the wonderful development of that service, which has brought countries widely separated by the sea, into nearer and closer relationship. We have had our attention directed to the further development of ocean steamships and likewise to projected "fast lines" to Europe, which, by abridging the period of the Atlantic voyage, are designed to bring the two continents into closer intercourse.

I do not doubt that in due time these projects will in some form be carried out with the gratifying result that they will tend to advance Canada among the nations by more firmly establishing her position on the highway of the world's commerce.

It is not my present purpose to dwell at any length on the possibilities of the future with regard to the application of steam machinery to the navigation of the ocean. My immediate object is to revert for a moment to the infancy of our present steam marine, to go back to the day when the first steam-ship started on her voyage across the Atlantic, when the passage between America and Europe by the agency of steam power was regarded as an experiment.

Sixty years ago the voyage was made by sailing ships. The fathers of many of us could have testified how long, how tedious and how trying the voyage then was, for it occupied frequently from one to two months. In modern times the trip across the Atlantic is reduced to a single week, for indeed by some of the best steam-ships it is generally accomplished in less than seven days, and we are encouraged to believe that before many years the passage will be made in a still shorter period.

A few weeks back the Engineering Society of Liverpool had the subject under examination, and it was then brought out in discussion that the Atlantic had been crossed by steam-ships no less than 3,800 times within the twelve months ending the 1st of October last, being on an average more than ten departures, that is five from each side, per day for

every day in the year. It was moreover affirmed in the discussion that "a 26-knot speed is not beyond the scope of advancing improvements."

As the narrowest part of the Atlantic extends from Great Britain to Newfoundland, the distance could be traversed by a 26-knot ship in 63 hours. Even a 22-knot ship (and this rate is about the present limit) could perform this part of the voyage in 75 hours. Thus it appears that enormous as has been the steamship development in the past, practical men do not consider it has reached its final stage. The ratio of increase may in future be diminished, but with all the evidence of progress before us, is it unreasonable to expect that a few years hence (assuming Newfoundland within the Canadian confederation) improved steam-ships will bring the shores of the Dominion within less than three days from the shores of the Mother Country, and that the passage will be made with the regularity of a daily ferry?

As Canada has acted a primary part in inaugurating the ocean steam service as it now exists, and which is so full of promise for the future, it appears to me becoming that we should cherish the memory of her sons, who, by their energy, skill and enterprise prominently aided in its development. Of those whose lives were closely identified with its first inception, the last survivor, Mr. James Goudie, lately died, and his death suggests that before the year comes to a close, steps should be taken to pay honor to the men who built and sent to sea the first regular steam-ship "to battle with the billows of the Atlantic." Is it not our duty to remember gratefully our fellow-country-men, who had the courage to undertake, and who successfully accomplished an enterprise, great in its conception and yet immeasurably greater in its consequences? It is no mere figure of speech to claim that these early efforts to which I will now allude, in no small degree assisted in inaugurating a system of inter-communication by sea, which has revolutionized commerce, and advanced the cause of civilization in the four quarters of the globe.

A paper was read last year before the Literary and Historical Society of Quebec by one of the Vice-Presidents, Mr. Archibald Campbell, on the passage made by the steamship "Royal William," nearly 60 years ago. Mr. Campbell enters into full particulars of the event, furnishes a diagram of the vessel together with letters from various individuals, comprising the ship architect, the builder, the captain and others in support of the claim that the first ocean steamship was built in Canada. Among other authorities, he refers to Mr. Kivas Tully, who, he states, "delivered a most valuable lecture in Toronto thereon before the Canadian Institute in 1877." Mr. Tully's paper cannot be found, but with the aid of the Assistant Secretary of the Institute, who has examined the

minutes, I have learned that it was read on Saturday, December 1st, 1877. There is a full report in the *Globe* of Dec. 3rd following, which I have examined. Mr. Tully gives a full and interesting account of the researches made by himself and others. Mr. Tully's paper is undoubtedly a valuable record and I respectfully suggest it should be published in our proceedings.

Mr. Campbell and Mr. Tully agree in the main; in my judgment the following conclusions are incontestably established :—

1. The first steamship to cross the Atlantic was built by a joint stock company at the yard of Campbell & Black in Quebec, in the year 1830-31.* (See information in foot-note, for which I am indebted to the kindness of Mr. Archibald Campbell, since this paper was read.)

---

*According to the Register of the "Royal William" in the Customs House, Port of Quebec, dated 22nd August, 1831, the subscribing owners, as Trustees of the incorporated "*Quebec and Halifax Steam Navigation Company*," representing sixty-four shares, were William Findlay, William Walker and Jeremiah Leaycraft, of Quebec, Merchants.

SHAREHOLDERS OF THE INCORPORATED COMPANY.

Parties constituted and declared to be one body corporate and politic by the name of "*The Quebec and Halifax Steam Navigation Company*," under 1st Wm. IV., Cap. 33 of Lower Canada Statutes :—John Forsyth, Wm. Walker, Wm. Finlay, John Caldwell, Jeremiah Leaycraft, Henry Le Mesurier, William Price, Matthew Bell, George Keys, William Pemberton, George Pemberton, Henry Pemberton, John Saxton Campbell, Robert Paterson, Robert Shortis, James Hamilton, James Gibb, Chas. Felix Aylwin, Hypolite Dubord, Noah Freer, Augustus Freer, Charles A. Holt, Francis Bell, James Hunt, Samuel Neilson, Wm. Lampson, John Leather, Robert Shaw, Wm. Phillips, John Ryan, James Stansfeld, Wm. Sheppard, Thos. Tucker, John Jones, jr., Benjamin Torrance, Wm. Henderson, Alexander Simpson, James Clearihew, Peter Paterson, Charles Francis Roy, George Black, Joseph Stone Shaw, John Racey, Duncan McCallum, Colin McCallum, Joseph Dyke, Robert Pope Ross, John Fraser, John Malcolm Fraser, John Bell, John Miller, James Saunders, James McKenzie, Margaret Urquhart, John Lambly, Alexander Morrison, Thomas Gordon, David Logan, George Taylor, Allison Davie, Robert Dalkin, John Munn, John Douglas, Archibald Campbell, Wm. Henry Roy, Wm. Carter, John McLeod, John Kerr, Robert Daunton, Robert Richardson, Thomas Gibb, Dominic Daly, Joachim Mondor, James Edie, Alexander Clarke, John Richardson, George Moffat, Peter McGill, Adam L. McNider, John Torrance, Robert W. Harwood, Hector Russel, Hart Logan, Lewis Gugy, Chas. Wm. Grant, Horatio Gates, Nathaniel Jones, Wm. Ritchie, James Brackenridge, Wm. Budden, Andrew Shaw, Samuel Cunard, Richard Harney, sr., Richard C. Tremain, Henry Prior, John Rutchford, jr., Alex Murison, Frederick W. Clarke, Edward De Blois, James Mitchell, J. G. A. Creighton, Thomas Grassie, Joseph Starr, Andrew Belcher, George Rundell, James Bridge, Robert Romans, Adam Esson, Temple Lewis Piers, John Alexander Barry, James Bain, George Smith, John Howe, George Russel, Alexander McDonald, James McDonald, William Carritt, J. Tobin, Mickel Tobin, George P. Lawson, Edward Potter, James H. Tidmarsh, Alexander Keith, Eliza Leggatt, William Brahm, Henry Lockeyer, Adam Dechezineany, Nicolas Le Cain, George Handley, Conrad West, John Stayner, Richard Marshall, Richard Davis, James Ritchie, Charles Delvolf, John Johnson, John Johnson, jr., Chas. Fairbanks, Alexander Primrose, Alexander McGregor, John Munro, David Hare, Thos. Maynard, Thos. Grant, Andrew Fraser, Peter McNab, Robert Downes, James T. Avery, Robert Dawson, Wm. Black,

2. The designer of the ship and superintendent of its construction was Mr. James Goudie, born in Quebec, 1809, and who died 1892.

3. This ship was launched in the spring of 1831, with more than ordinary ceremony. The governor of the province Lord Aylmer was present

---

Jonathan Tremain, J. Boggs, George Hartshorne, Wm. Mortimer, John Barron, Wm. Stairs, Wm. M. Allan, Joseph Austin, George Innis, Patrick Ross, James Leisham, Wm. F. Young, Rufus Black, Joseph Danby, George Turner, George Barton, Samuel Davis, Francis Le Cain, James Wilkie, Samuel Mitchel, David Starr, James Robb, James L. Stair, Ed. M. Archibald, E. Ross, I. Primrose, James McNab, Jasper Reoust, Allan McDonald, I. Shannon, Joseph Allison, George Young, Wm. Young, Philip J. Holland, Daniel Starr, L. Yates, Wm. McCara, Charles Keefler, Charles Rigby, Wm. Foster, John Romans, Wm. Woodill, Jas. Donaldson, Benjamin Schneller, Alexander Rankin, Thos. H. Peters, James A. Street, Alex. Fraser, jr., John Fraser, Andrew Crane, Joseph Allison, Hugh Morrell, Wm. Lock, Joseph Cunard, Richard Blackstock, Christopher Clarke, Gilbert Henderson, Robert Henderson, Patrick Henderson, Joseph Russel, John Hawbolt, James Letson, Asa Willard, J. M. Johnson, Alex. P. Henderson, John S. Willaston, Thomas C. Allan, Wm. Carman, jr., George Taylor, Henry Cunard, Wm. Eade, Ed. McQuillan, Joseph Samuel, Mary Little, Daniel Kieth, Caleb McCully, Alexander Sherriff, John Samuel, Gorwin Rainie, Francis Peabody, Martin Cramey, Alexander Key, Noah Freer, Francis Durette, James Black, James McDonald, John Torrance, William Price, William Walker, and John Jones.

CERTIFICATE OF COLLECTOR OF CUSTOMS FOR PORT OF QUEBEC.

REGISTER OF STEAMSHIP "ROYAL WIILLIAM."

No. 13. Port of Quebec. Dated 18th May, 1833.

Name, "Royal William." Burthen, 363 60-94 tons. John McDougall, Master. Built at this port in the year 1831, which appeared by a former certificate of registry, No. 42, granted here the 22nd August, 1831, now delivered up and cancelled upon transfer of property.

Name and employment of surveying officer. (Signed) C. SECRETAN, Acting.

One deck and round-house, 3 masts; length, 160 feet; breadth taken above the main wales, 44 feet; height between decks, or depth of hold, 17 feet 9 inches. Schooner rigged with a standing bowsprit; square sterned; carvel built; quarter badges; scroll head; admeasurement afloat; propelled by steam, with wheels or flyers at each side.

Subscribing Owners.		*Shares.*
James Bell Forsyth,	of Quebec, Merchants.	Ten.
Jeremiah Leaycraft,		Ten.
Henry Le Mesurier,		Ten.

Other Owners.		*Shares.*
Mathew Bell,	of Quebec, Merchants.	Fourteen.
Noah Freer,		Ten.
Henry John Caldwell,		Ten.

De Novo, London, 22nd Nov., 1833.

A true copy.

Customs House, Quebec, 2nd March, 1891.

(Signed) D. D. O'MEARA,
Acting Registrar of Shipping.

The steamship "Royal William," McDougall, Master, cleared on Saturday, 3rd August, 1833, for London, and sailed at 5 o'clock, a.m., Monday, 5th August.

The "Royal William" arrived at Gravesend, 25 days passage from Pictou, Nova Scotia.

(Signed) W. DUNSCOMB,
Collector of Customs.

Port of Quebec, 5th February, 1872.

with his staff, the military authorities and the band of the 32nd Regiment. The event was further honored by the presence of Lady Aylmer who in the customary manner gave the vessel the name of the "Royal William" after King William IV., then on the throne.

4. The ship was towed to Montreal to receive her machinery,* and on being fitted for sea, her first voyage was to Halifax. Before setting out for England, she traded between Quebec, Halifax and Boston. She was the first British Steamer to arrive at the latter port.

5. In the list of owners appear the names of the three brothers Joseph, Henry, and Samuel Cunard of Halifax.

6. Her dimensions were length 160 feet; hold 17 feet 9 inches; breadth outside 44 feet; breadth between paddle boxes 28 feet; she had three masts schooner rigged; builder's measurement 1,370 tons; with accommodation for 60 passengers.

7. She left Quebec for London August 5th 1833, called at Pictou, Nova Scotia, to receive coal and overhaul machinery. She re-started from Pictou, August 18th, with seven passengers, 254 chaldrons of coal and a light cargo. She encountered a terrific gale on the banks of Newfoundland which disabled one of her engines. The passage from Pictou to London occupied 25 days.

8. Ten days after her arrival in London she was chartered by the Portuguese government to enter the service of Dom Pedro as a troop ship.

9. In 1834 she was sold to the Spanish government, was converted into a war steamer, and under the new name, of "Isabel Secunda," was employed against Don Carlos. A letter from the well known Alexander Somerville, who, as he tells us, joined the British Legion and became a colour-sergeant, appeared in the Toronto *Globe*, May 15th, 1876. This letter describes an incident which came under his own observation, May 5th, 1836, off St. Sebastian, Bay of Biscay. Mr. Somerville remarks, that the Canadian built ship "Isabel Secunda," (originally the "Royal William,") "was the earliest steamer of war in the history of nations to deliver a hostile shot."

10. After an eventful service for some years she was sent to Bordeaux for repairs, when her timbers were found to be somewhat decayed;

* I am informed on excellent authority, that the engine, boiler and machinery were furnished by the Montreal works, known as St. Mary's foundry, Charles Wm. Grant, Baron de Longueiul, proprietor. The signature of the Baron, Charles Wm. Grant, is attached to the original list of shareholders of the incorporated steamship company, and it is stated by his descendants that he sunk of his private means in all about $40,000, in the venture of the "Royal William." S. F.

the engines, however, were in serviceable condition, and were transferred to a new vessel, a second "Isabel Secunda," to form part of the Spanish navy. What was left of the original "Royal William" remained a hulk in the French port.

Both Messrs. Tully and Campbell allude to the claims set up in the United States on behalf of a ship, "The Savannah," as the vessel which made the transatlantic voyage under steam at an earlier date. An article making this claim appeared in *Harper's Magazine*, for February, 1877. We there learn that the "Savannah" was built in New York and launched on August 22nd, 1818. She was 350 tons burden. A steam engine was placed on deck, and shifting paddle wheels were contrived so that they could be lowered over the sides of the vessel in calm weather and brought again on deck when the wind rose. She had small capacity for coal, indeed it is doubtful if she consumed coal, a description of fuel but little used in the United States in those day; at least one authority states that the only fuel consumed on the voyage was wood. It is not possible to differ from the conclusions formed by Messrs. Tully and Campbell that the "Savannah" was simply a sailing ship, to which had been added light paddle wheels capable of being driven by steam machinery, the whole of a somewhat rude description yet in a way available for keeping the vessel in motion when the wind failed.*

The "Savannah" crossed the Atlantic in 1819. She left Savannah on the morning of May 22nd and reached Liverpool on the evening of June 20th making the passage in less than thirty days. It is stated that steam was used on eighteen days, and the log records that the shifting paddles were used for a few hours at a time when the condition of wind and sea admitted, but it is obvious that the sails were chiefly depended upon throughout the voyage.†

The "Savannah" remained at Liverpool from June 20th until July 23rd when she sailed for the Baltic and at the ports where she called,

---

* A writer in *Scribner's Magazine*, May 1887, states, "the paddles were constructed to fold up and be laid on deck while not in use," and the "log" describes the process of shifting the wheels, which did not occupy more than 30 minutes.

† *Popular Science Monthly* New York, January 1893, after an examination of the Log of the Savannah, has the following: "The voyage to Liverpool began May 22nd, 1819. On the 24th, at 5 a.m. the Savannah got under way off Tybee Light and put to sea with steam and sails; at 6 a.m. left the pilot; at 8 a.m. took off the wheels in twenty minutes, this was to insure the wheels getting safely to Liverpool. The Savannah reached Liverpool, steaming up the Mersey, in twenty-nine days eleven hours from Savannah, having run eighty hours under steam." This information gives for the whole voyage 707 hours, of which 80 hours were under steam, and 627 hours without steam being used. Possibly the paddles were employed on eighteen days, for a few hours each day. S. F.

excited some curiosity. On Oct. 10th she set sail from St. Petersburg on her homeward voyage and arrived at Savannah, Nov. 30th. There is no mention of the paddles having been used on the return voyage or indeed at any time after she left St. Petersburg. The writer in Scribner states that on the return of the "Savannah" to the United States the machinery was removed and she assumed her original character as a sailing ship. She was finally wrecked, and found a resting place on the south shore of Long Island.

It may not be out of place to allude to information independently obtained with respect to both vessels. Some of the older citizens of Toronto will remember Captain Sutherland who commanded the steamer Magnet on Lake Ontario, before he met with his sad fate at the Desjardins Canal accident in 1858. He, it was, who thirty-four years earlier assisted in preparing the "Royal William" for her long voyage to England, and actually accompanied her as second in command as far as Pictou, when she left Quebec on August 5th, 1833. Many of the particulars described by Messrs. Tully and Campbell I had from the lips of Captain Sutherland, who related them to a number of gentlemen of whom Sir George Simpson, Governor of the Hudson Bay Company was one, on a passage by water from Toronto to Kingston about the year 1850. This independent testimony fully corroborates that which has been set forth respecting the "Royal William."

I had occasion ten years ago to make enquiries with regard to the "Savannah." I addressed a citizen of Savannah whose acquaintance I had made after the war, when he visited Canada. This gentleman at my request examined all the records to be found in his native city respecting the ship "Savannah" and her means of propulsion. He wrote me at length, and described the machinery attached to her as being of a somewhat rude description; there was nothing to show, he informed me, that it had been continuously employed on the voyage. I quote part of his letter: "She resembled very much in mould an old United States frigate. The hull was surmounted with a stack and three masts—fore, main and mizen—and was provided with side wheels of a primitive pattern, left wholly exposed to view, and so arranged that they could at any time be unshipped and the vessel navigated by sails only."

Giving the "Savannah" the fullest credit for all that may be due to her, it cannot be affirmed that she crossed the Atlantic under steam, nor can it be pretended that she was the pioneer of the ocean steam-ship service of to-day, in any sense. It may with greater truth be held that the "Savannah" had a deterring influence on the further efforts of enterprising ship-builders, and that the introduction of transatlantic steam-

ship service was actually retarded by the ill-success of the attempt of 1819. The mode of propulsion employed at intervals on the eastward voyage of the "Savannah" was abandoned and she returned to America under sail. Its partial use on the first voyage stimulated no effort to alter or improve the makeshift machinery used, or to introduce something more perfect and more permanent on ships subsequently constructed. It set in motion no attempt to send to sea a second "Savannah" to cross the Atlantic by steam power. The only other example on record of a vessel similar to the "Savannah" is the "Enterprise," a ship which made a voyage in 1825 to India assisted by steam. Like the "Savannah" she depended on her sails, using steam at intervals when there was no wind. This adventure, like that of the "Savannah," was entirely barren of any beneficial results. Attention continued to be directed to the improvement of ordinary sailing ships, and as a consequence there came into existence a magnificent class of vessels known as "clippers," propelled only by wind and sail. It was not uncommon for ships of this class to cross the Atlantic in half the time occupied by the "Savannah." If we except the "Royal William" in 1833, there is no record of any ship, propelled in whole or in part by steam, having made the passage between any British port and any American port for nearly twenty years after the performance of the "Savannah."

The "Royal William" exercised an influence of a directly opposite character. One result was to make clear that the transatlantic vessel of the future was to be a steam-ship. Sir Samuel Cunard with his two brothers were, as shareholders in the Quebec and Halifax Steam Navigation Company, part owners of the "Royal William." Cunard was a man of great business ability, rare shrewdness, and with much originality of character. The success which attended the experiment led him to foresee the possibility, nay the certainty of future triumphs. It became evident to his mind that sailing ships as mail packets were doomed. He at once grasped the situation, and determined the course which he subsequently pursued. His effort was to obtain a contract with the British Government for carrying the mails, and after constant perseverance and great delay, he finally succeeded in 1838. The service agreed upon was fortnightly in the first place, and afterwards weekly. The "Britannia," the "Acadia," the "Caledonia" and the "Columbia," were at once placed under construction, and these four vessels formed the beginning of the magnificent fleet of steamships which ever since have borne the honoured name of Cunard.

Quite distinct from the action of Mr. Cunard, and while his negotiations were in progress, the British and American Steam Navigation Company

was founded by enterprising merchants in the Mother Country. This Company was formed in 1836, within three years after the passage of the "Royal William," and immediately the construction of the "Great Western" specially for the Atlantic voyage was undertaken; the "Sirius" was chartered for the same purpose. These were the first steamships to cross the ocean after the "Royal William." The "Sirius" left London on April 4th, 1838, the "Great Western" left Bristol three days later, and by a singular coincidence they both steamed into New York Harbour on St. George's day. Other steamships followed in rapid succession, among them I may mention the "Liverpool" and the "Royal William;" both were built in England, and both began their trips a few months after the "Sirius" and "Great Western." The latter "Royal William," the second of this name has led to some confusion, from being better known than the Quebec vessel built eight years or so earlier; and it has caused the first "Royal William" somewhat to pass out of memory.

To my mind it is incontestably established that the memorable voyage of the Canadian built "Royal William" from Quebec to London in 1833, must be held to be the first passage across the Atlantic under steam; that passage triumphantly demonstrated the practicability of steam navigation on a voyage between the two continents, notwithstanding the declaration of Dr. Lardner, who at that date pronounced it "perfectly chimerical, and" to use his own words, "they might as well talk of making a voyage from New York or Liverpool to the moon."

The Canadian built "Royal William" undoubtedly proved to be the pioneer of Atlantic steamships. It cannot be disputed that she was the forerunner of the Cunard line, and as such she was equally the forerunner of the thirty-four other lines which to-day run regularly between America and Europe. It must certainly be admitted that this pioneer ship has had no small influence on the ocean steam service of the globe —a service which embraces the great lines running to India, China, Japan, South Africa, South America and Australia, a service consisting of ships which may be counted by thousands with a gross tonnage of 12,000,000 tons. And to us Canadians and British subjects it is interesting to note that *two thirds* of this enormous tonnage belong to Great Britain, Canada and the Colonies, while the remaining *one third* may be claimed by all the other nations of the world.

We must all regard with satisfaction the circumstance that Canada has the proud distinction of having taken the initiative in applying science and mechanical skill to a purpose which has led to such splendid results. Is it not a national duty that we should honour the memory of the men

whose skill and enterprise have in advancing these results done honour to Canada? Would it not therefore be becoming on the part of the Canadian Institute to initiate a movement to establish some enduring record in commemoration of the voyage of the "Royal William" in 1833, and in honour of those connected with her? The record might take the form of a brass memorial tablet, or as may hereafter be determined, placed in some fit position in the halls or corridors of the Parliament Buildings at Ottawa. This course is followed in the mother country, where records of great historical events can be seen in the entrance Hall of the Houses of Parliament at Westminster.

Whatever form the suggestion may assume, or wherever placed, it will be a lasting tribute to the skill and courage of the men associated with the first transatlantic steamship. Such a record is due to our country and our countrymen, and the proposal having its origin in Toronto will be accepted as a graceful compliment to a sister city, where the "Royal William" was designed, constructed and sent to sea. The memorial itself will denote an incident in our annals of which all Canadians of whatever race, may feel allowable pride. It will indicate the point of commencement of a new era in the history of navigation. It will mark the part which Canada has played in the inauguration of a system of inter-communication which has contributed in a remarkable degree to the advancement of civilization; and which has exercised and will long continue to exercise an important influence on the destinies of the human race.

NOTE ON EARLY STEAMBOATS.

BY SANDFORD FLEMING, LL.D., C.M.G., ETC.

(Read 17th December, 1892).

There are many records of attempts to propel vessels by steam before the beginning of the century. The most successful were those of Mr. Miller, on Dalswinton Loch in Scotland in 1788 and of Mr. Symington on the Forth and Clyde Canal some twelve years later. These and other inventors devoted much time and money to accomplish the object they had in view and much credit is due to them for the ingenuity displayed;

but these early efforts were of the character of experiments, and it is generally conceded that the first really successful attempt to navigate water by steam power for regular public traffic was in 1807.

In that year a vessel named the "Clermont" was launched on the Hudson. She was built by Mr. Fulton, who had visited Scotland and profited by the efforts of Miller and Symington. Fulton was assisted with money by Mr. Livingstone, then American Minister at Paris. The "Clermont" was 130 feet long with a breadth of 16½ feet. Her engine was made in England, at the celebrated works of Boulton & Watt. She attained a speed of five miles an hour, proved a practical success and carried goods and passengers between New York and Albany for some years.

If we have the best grounds for stating that to Canada is due the honour of sending to sea the pioneer ocean steamship, we must fully acknowledge that the first steamboat in the world, regularly and continuously engaged in passenger traffic, was produced in the United States.

In 1809, two years after the "Clermont" made her trial trip on the Hudson, the first steamboat appeared on the St. Lawrence. I am indebted to Dr. S. E. Dawson for the following interesting details: "On November 3rd, 1809, the steamer "Accommodation," carrying ten passengers, left Montreal on Wednesday at 2 o'clock in the afternoon, and arrrived at Quebec on Saturday at 8 o'clock in the morning. She anchored every night, and that practice was continued for many years on the St. Lawrence, so that of the 66 hours which intervened between her departure and arrival at Quebec, 30 hours were spent at anchor; the trip was therefore made in 36 hours. This steamer was built for John Molson, the first of the name. She was 75 feet long in the keel and 85 feet long on deck."

In addition to these details, the following which appears in the *Quebec Mercury*, after the arrival of the vesssel on her trial trip, may be of some interest: "On Saturday morning at 8 o'clock, arrived here from Montreal, being her first trip, the steam-boat "Accommodation," with ten passengers. This is the first vessel of the kind that ever appeared in the harbour. She is continually crowded with visitants. She left Montreal on Wednesday at two o'clock, so that her passsage was sixty-six hours, thirty of which she was at anchor. She arrived at Three-Rivers in twenty-four hours. She has at present berths for twenty passengers, which next year will be considerably augmented. No wind or tide can stop her. She is 75 feet keel and 85 feet on deck. The price for a passage up is nine dollars, and eight down—the vessel supplying provisions. The great advantage attending

a vessel so constructed, is that a passage may be calculated on to a degree of certainty in point of time, which cannot be the case with any vessel propelled by sails only. The steamboat receives her impeller from an open double-spoked, perpendicular wheel, on each side, without any circular band or rim. To the end of each double spoke is fixed a square board, which enters the water, and by the rotary motion of the wheel acts like a paddle. The wheels are put and kept in motion by steam, operating within the vessel. A mast is to be fixed in her for the purpose of using a sail when the wind is favourable, which will occasionally accelerate her headway."

These extremely interesting details obviously written by an eye witness describe the second steamboat which ever made regular trips in American waters, or in any part of the world for trade purposes. That she proved successful as a commercial venture may be judged from the fact that within a few years after she commenced running Mr. Molson added two other steam-boats the "Swiftsure" and the "Malsham" of increased dimensions. The former vessel was 130 feet in length of keel and 140 feet on deck with a width of 24 feet. On her trial trip, in 1813, the "Swiftsure" made the passage from Montreal to Quebec in 22½ hours notwithstanding that the wind blew strong ahead the whole distance. She beat the fastest sailing packet on the line 14 hours in a race of 36 hours. The "Malsham" was built in Montreal in 1814, and was registered at the Custom House, Quebec, May 4th, 1815. In the registry she is described as a "steam vessel worked by steam, with wheels or flyers at each side."

The successful application of steam to the propulsion of vessels being established, it soon spread to other countries. As far as I have been able to investigate the matter, regular steam boats were seen for the first time in the following order: on the Hudson, in 1807; on the St. Lawrence, in 1809; on the Clyde, in 1812; on the Severn, in 1813; on the Mississippi, in 1814; on the Humber, in 1814; it was 1815 before the first steamboat, a small vessel named the "Marjorie," appeared on the Thames; the same year witnessed the "Frontenac" plying on Lake Ontario. The latter steamboat was built by the enterprise of the late Senator John Hamilton of Kingston, at a cost of £20,000.

The third vessel on the list, that launched on the Clyde, in 1812, was named the "Comet." She was built by Henry Bell. Her length was 40 feet with 10½ feet beam; her draught of water 4 feet; her speed under favorable conditions was four miles an hour. She continued to ply between Glasgow and Greenock a distance of about 20 miles, for some years. The "Comet" greatly improved appears to have been transferred to the River Forth where she did her work more efficiently; she ran for a

considerable time between the terminus of the Forth and Clyde canal and Newhaven a distance of 27 miles at the rate of 7½ miles an hour.

Much importance has been attached to the efforts of Henry Bell, the builder of the "Comet." A grateful country has evinced its appreciation by erecting a noble monument to his memory. This monument is conspicuously placed on a promontory of the River Clyde, where it may be seen by every passenger passing up or down the river. The "Comet" was the first steamboat in Europe engaged in any serviceable purpose; three years before the "Comet" was launched, Canadian enterprise placed the "Accommodation" on the St. Lawrence, and for many years this vessel continued to run regularly, carrying passengers and freight between Montreal and Quebec.

All honor to the memory of John Molson, the master mind who caused to be built and who directed the movements of the first steamboat on Canadian waters! Can we do less than find a place for a second memorial tablet to commemorate an event of no small interest in the annals of our country?

NOTE ON POSTAGE STAMPS.

By Sandford Fleming, LL.D., C.M.G., Etc.

(Read 17th December, 1892.)

I am desirous of submitting to the Canadian Institute a matter which may possibly, to some, appear to be of little importance, but which nevertheless affects the daily lives of many of us, and in this point of view may claim public attention.

The system of adhesive stamps for the prepayment of letters came into operation during the last half century. There was not a single postage stamp in use in any part of the world before the year 1840. Now there are thousands of different kinds and they are used by millions daily by all the different nationalities of the world.

Postage stamps were officially established in the British Islands fifty-

two years ago. The first foreign state to adopt them was the Canton of Zurich in Switzerland, in 1843. They were introduced into the United States in 1847. Throughout Europe they became common in 1849 and 1850. In Canada they were employed for the first time in 1851. Until that time the post office in the British American provinces had been controlled by officers appointed by the home government. On April 6th, 1851, the entire management was transferred from Imperial to Provincial authority and within the same year several important reforms were carried into effect. Previous to that date the charge for the carrying of letters was extremely high — inland postage averaged nine pence currency (15 cents) per letter. It was at once reduced to three pence (5 cents). For three years longer the charge on foreign letters remained at the old rates, viz., one shilling and fourpence currency (about 27 cents) on English, and sixpence (10 cents) on United States letters.

The first Post Master General for the Province of Canada was the Hon. James Morris, and it was under his administration that the reduction on the postal charge on inland letters was made, and adhesive stamps for their prepayment introduced. Canadian postage stamps, for the three penny rate, were first issued for public use on St. George's day, April 23rd, 1851.

It is with no desire to cast any reflection on Mr. Morris, under whose auspices great postal reforms were initiated, when I humbly point out that the stamps introduced by him were anything but faultless. Forty years, experience has established, that the designer whom Mr. Morris employed, failed to recognize the essential features which a postage stamp should possess; and strange as it may seem the worst features of the original faulty design still remain. From 1851 to the present date, the defective characteristics of the first stamp have in a greater or less degree been preserved in every successive issue.

Stamps of different values are necessary for the prepayment of letters and postal packets, varying in weight. Obviously, a postage stamp should on its face, plainly indicate its value, so that it should present no difficulty to the person using it. The three-penny stamp in 1851 had on each of its four corners a small figure "three" (3) to denote its value, its designer seemingly ignoring the fact that one large figure would be plainer than four or any number of small figures We may trace to this source the crucial defect of every Canadian stamp since issued, for whatever changes have been made in those printed from year to year since their first introduction, the small figures to indicate their denomination have been constantly adhered to. When we examine the whole series there is a strong family likeness in this particular. Indeed the stamps in common use to-

day so much resemble each other that many persons can distinguish them only by close examination. Take for example the three cent and the one cent stamps; in general design they are identical, and the figures 3 and 1 in each case are so minute as to be scarcely distinguishable in an artificial light, and more especially by persons advanced in years. It is true that with the intention of assisting the eye stamps are printed in different colours; red in one case, yellow in another, green in a third, and so on; but this mode of distinction in no way mends matters to those suffering from what is known as colour blindness. In truth it aggravates the evil, as some of the colours in use render the whole design, especially in certain lights, next to invisible. It is not surprising therefore, that one stamp is apt to be taken for another, as is frequently the case, unless care be taken to seek the aid of some person whose vision is in no way defective. It cannot be held that the class of persons who in various degrees are incapable of distinguishing colours, are of no account. According to the best authority it is estimated that one in every twenty is colour-blind. This rate would give for the whole Dominion not less than a quarter of a million souls who suffer from this incapacity. With justice and reason we may ask, why should this number, or any considerable number of the population, be disregarded in a matter which affects their daily lives? I can bear personal testimony to instances constantly arising from the difficulty in distinguishing the postage stamps in common use. In my own limited sphere scarcely a day passes without meeting with petty annoyances from the cause assigned. Personal inconvenience is of small consequence as a rule; but in this case it is an experience which suggests how enormous must be the aggregate inconvenience traceable to the same cause. Moreover, the sender of letters is not the only sufferer from these petty annoyances, as letters improperly stamped have been known to remain in the dead letter office, or have had double charges levied on delivery to the receiver.

I have, by implication, cast blame on the individual responsible for the details of the first stamp issued. Referring to some old memoranda I there find the original design or rather its *facsimile* in the first proof from the engraver's plate, and I am thus reminded that the blame must rest to a large extent upon myself, inasmuch as, at the request of the Postmaster General I furnished the design bearing date February 1851. It must however be said that the stamp then issued is not the same in all respects as the present stamp. Among the changes which have been made, an effigy of the Queen's head has been substituted for *a beaver*. Her Majesty's portrait is always seen with satisfaction and few will fail to recognize the appropriateness of this change if they keep out of view the process of cancellation by the post office officials. The objection

which must be taken to the stamps in use to-day throughout the Dominion is on the ground of the inherent defect which I have pointed out, a defect which they have inherited from the parent stamp of 1851.

Frankly acknowledging my own responsibility with regard to the objectionable feature referred to, I feel that a peculiar moral obligation is imposed upon me to endeavour to make such reparation as may be in my power, for the evils which have been transmitted to the present day through successive generations of stamps. Accordingly I take upon myself the duty of respectfully recommending that the design of our Canadian postage stamps be reconsidered and remodelled. With this in view I beg leave to offer two suggestions, viz.:—

First.—That the Queen's Head be retained but on a reduced scale and so placed that it will occupy the upper half of the stamp, leaving in the lower half ample space for a single large figure to denote the value. This course is now followed in some of the more recent English stamps, and I would instance the two pence half-penny stamp, used for foreign postage. If all our Canadian stamps were designed on this principle, the defects which have been mentioned would be removed.

Second.—Another course would be to substitute the Imperial Crown for the Queen's Head, placing it over a panel or shield on which would be inscribed in large plain figures the denomination of the stamp, in some such manner as shown in the sketch.

For those who fortunately can distinguish colours, no doubt much benefit is to be found in their use, in printing stamps of different values, but I hold that the employment of colours should be secondary as a means of distinguishing one stamp from another. I humbly submit that it should be held to be an essential feature of all stamps hereafter issued, that the distinctive number be so plain and so conspicuous and so unmistakable, as to be easily recognized by all persons under ordinary circumstances.

With great respect I submit these remarks for the consideration of the members of the Canadian Institute. If they commend themselves to the approval of this Society, the Council will, I do not doubt, deal with them in the mode which they conceive will generally best serve the public interests.

THE MIGRATION OF THE EVENING GROSBEAK IN 1890.

By J. B. Williams

(Read December 7th, 1891.)

In a chapter on the migration and diffusion of animals in his Principles of Geology, Sir Charles Lyell writes as follows :—" Besides the disposition common to the individuals of every species slowly to extend their range in search of food, in proportion as their numbers augment, a *migratory instinct* often develops itself in an extraordinary manner, when after an unusually prolific season, or upon a sudden scarcity of provisions, great multitudes are threatened with famine."

As instances of these irregular and spasmodic migratory instincts he mentions the Leming (*Mus lemmus*) in Lapland, (countless thousands of these little creatures, once or twice in a quarter of a century, leave their homes in the mountains, and march to the sea-coast ;) and the Springbok or Cape Antelope, which used to descend at intervals of three or four years from the interior of South Africa to the cultivated districts around the Cape.

Birds as well as quadrupeds are subject to these irregular migrations.

In April and May, 1888, great numbers of Pallas' Sand Grouse (*Syrrhaptes paradoxus*) migrated from their home in Tartary to Europe, and appeared in England, Scotland and Ireland in great numbers.

They were first seen near Warsaw, in Poland, on April 21st ; near Leipzig, in Saxony, on April 27th ; but they did not reach England until about the middle of May.

Though they laid eggs in several places, they do not seem to have reared any young that first summer.

With the hope that some of them might be acclimatized to the country, Parliament passed a special Act making it illegal to shoot them until January, 1892.

Great numbers were shot before the Act came into force, but there were several well authenticated instances, of those that survived the winter rearing young ones during the summer of 1889. A somewhat similar migration of the Sand Grouse occurred, twenty-five years before, in 1863.

The Rose-colored Pastor (*Pastor roseus*), a bird allied to the English Starling, affords another example of these irregular migrations. An immense flock of them, numbering many thousands, appeared in the neighborhood of Sophia, the capital of Bulgaria, in the month of June, 1889. They were very tame, and were easily caught by hand.

This bird's usual habitat is in Armenia, Persia, and Southern Russia.

A similar flock visited Bulgaria, twelve years before, in 1877.

In January and February, 1890, the city of Toronto was invaded by hundreds of Evening Grosbeaks (*Coccothraustes vespertina*).

This bird is described in Mr. Chamberlain's Catalogue of Canadian Birds as " an abundant resident of British Columbia, east of the Cascades, and occasionally found on the western slope, and in Vancouver Island. It is a common winter visitor to Manitoba, and a few specimens have been taken in Ontario." And in Ridgeway's Manual it is said to be an irregular winter visitor to Michigan, Wisconsin, Illinois, and Iowa.

There are records of their occurrence, in small numbers, in Ontario on four occasions, viz.: in the years 1854, 1866, 1871, and 1883 ; but in 1890 they came in numerous flocks, and some went as far as Montreal. In the States they visited Pennsylvania, New York, Vermont, New Hampshire, Massachusetts and Connecticut, States, which, with the exception of New York, they had never before been known to visit.

Some of them remained till the end of April, or beginning of May, after which they all seem to have returned to their usual habitat.

Their name was given them under the impression, which seems to have been erroneous, that they sang in the evening.

They belong to the large family of the *Fringillidæ* or Finches.

The conical shape of the beak is a distinguishing feature of this family, and this feature is more strikingly developed in the Evening Grosbeak than in any other finch of this continent, so that its beak is a very powerful instrument for cracking seeds and nipping off buds.

The European representative of the genus *Coccothraustes* is the Hawfinch (*C. vulgaris*), a bird that is often found in England. You will see from the specimen that I exhibit, that the conical bill is even more developed in this bird, than in the Evening Grosbeak.

THEIR APPEARANCE IN ONTARIO.

Mr. McIlwraith writes from Hamilton that "the Grosbeaks were first observed there on Dec. 19th, 1889. Flock after flock passed along, going

east, till near the end of January, when for a few days none were seen. About Feb. 10th the return migration began, and was very active while it lasted ; but they were only noticed for three or four days."

Mr. Ernest E. Thompson reports that a flock of about twenty were seen at Lorne Park, fourteen miles west of Toronto, on Jannary 16th, and on January 18th Mr. Cross, and Master Charles Harvey, a son of our President, met with specimens in Rosedale, Toronto. A male bird, that Master Harvey procured then, he presented to our Museum. The white secondary quill feathers of the wing, in this specimen, are shaded with brown like those of the female.

The first time I saw any of these birds, was on January 22nd. I had gone out to Rosedale Heights with a gun, hoping to meet with some, as there had been a north-west wind on the previous day. After wandering about for some time, I heard what, at a distance, seemed like the creaking of a gate repeated over and over again. I walked in the direction of the sound, and, as I approached nearer, it increased to quite a number of quiet whistlings, and I saw, just in front of me, a flock of about fifteen Evening Grosbeaks. Their thick beaks gave them quite a parrot-like appearance as they ran about among the bushes, searching for seeds that had fallen on the ground. I followed them closely for some distance before they took any notice, and then the whole flock flew into a small tree by the roadside. I fired, and a pair of them fell. It was difficult to see the female bird as it lay on the greenish-brown herbage at the roadside, so closely did its plumage match the surrounding tints. The striking black, yellow, and white colours of the male bird were, of course, more conspicuous.

There are many birds that exhibit these striking differences in the colour of the sexes. The quiet tints of the female conceal the bird when sitting on its nest, and protecting its young, while the more striking colours of the male bird make him very conspicuous. Mr. Darwin attributes the bright tints of the male, very largely, to the preference of the females, and their continued selection of bright colored partners.

It often seems, however, to be the duty of the male bird to attract, not only the attention of the female, but also, that of any enemy that approaches too near her, and to lure away the enemy from the nest and eggs, by his attractive colours, or peculiar antics. The Scarlet Tanager, the Towhee, and Bob-o-link are, I think, examples of this.

The Grosbeaks were very numerous in the neighbourhood of the city until the end of January. There was very little snow about, and they fed largely on the ground.

Then, for about a week, they nearly all disappeared. On the night of February 7th, snow fell heavily, and on the 8th great numbers of them appeared again in, and around the city. They now fed largely on the Mountain Ash berries, and for three or four days were almost as common in the suburban streets as the English Sparrow.

This would be, according to Mr. McIlwraith's observations, the return journey of the main body of the migrants. Most of them had left by February the 10th, the very day on which the advance guard reached Hamilton.

Some were seen at Lorne Park on February 15th, and flocks were occasionally seen near Toronto until the middle of May, but none of them, as far as I have heard, remained to breed in this district.

Specimens were taken in Montreal at the end of January, and on February 5th. This is just the time, during which, they were absent from Toronto.

THEIR APPEARANCE IN THE STATES.

In the 1890 edition of the Birds of Pennsylvania, Mr. Warren says that they first appeared in that State on December 17th, 1889, and single birds, and small flocks, were seen until the middle of April, 1890. One flock, however, of about forty, remained at Montoursville, Lycoming Co., until the beginning of May.

Early in April, says an observer, they appeared restless, and on April 30th had separated into pairs, and seemed likely to build there, but were disturbed by a gunner, and all left on May 11th.

They were first seen in New Hampshire on January 4th; in Massachusetts January 8th; but are not recorded in Connecticut until the end of February. They seem to have entered the New England States *via* the north shore of Lake Ontario, and remained in them until the end of March.

THE CAUSE OF MIGRATION.

Sir Charles Lyell, in the passages already quoted, gives two causes for their irregular migrations, viz., an unusual increase in numbers, and an unusual scarcity of food.

Our Dr. Brodie thinks that the migrations of the Pine Grosbeak are often caused by the freezing of rain on the forests where the birds usually obtain food. Everything being then coated with ice, it is difficult for them either to perch on the branches, or procure seeds, and they come south for food.

These Pine Grosbeaks visited Toronto in great numbers while the Evening Grosbeaks were here. They were also very numerous six years ago, in February and March, 1884.

Professor Newton of England thinks that the Sand Grouse migrations to Europe were caused by great increase in numbers, and a consequent difficulty in procuring the means of existence.

The evening Grosbeaks, probably, breed in uninhabited districts, where they have no human and, perhaps, very few natural enemies. They may have so increased in numbers that their usual winter supply of food was inadequate for them, and hence the unusual extent of their migration. But whatever was the cause, they all seem to have returned to their usual haunts for the breeding season.

THEIR FOOD.

Their food was very various. In Ontario they fed on the berries of the Cedar and Mountain Ash, on apple seeds, choke cherries, haw-stones, and on the sprouted seeds of the Maple and White Ash.

They were very tame while in Toronto, often allowing themselves to be approached within a few feet, and many of them were caught alive, and kept for some time in cages. One female belonging to Mr. G. E. Atkinson is still living.

I have a mounted specimen of a male bird on the table, kindly lent by Mr. Blackburn, which shows very distinctly the whitish spot on the inner web of the two outer feathers on each side of the tail. Only a few of the males show this marking, the tail feathers being, generally, entirely black. The specimen exhibited, was taken in Toronto during the second week in February, 1890.

THE BRESSA PRIZE.

(Translated from the Italian, and read 3rd April, 1892.)

In the year 1836, Cesare Alessandro Bressa, Doctor of Medicine, died at Mortara, Italy, leaving to the Royal Academy of Science of Turin, the means for awarding biennial prizes as follows:—

The net income of the first two years is given as a reward to that Scientist of any nation, who during the past four years has made the most remarkable and useful discovery, or produced the most celebrated work in connection with Physical and Experimental Science, Natural History, Pure and Applied Mathematics, Chemistry, Physiology and Pathology, not excluding Geology, History, Geography or Statistics.

The net income of the second two year period is given for the same services, but competition is confined to Italian Scientists.

As the principal is over 100,000 francs, the biennial prize amounts to about $2,500.

The prize for 1891-92 must be given to Italians only. That for 1893-94 will be open to the world, and the Canadian Institute will give to any of its members, all particulars which have been or may be from time to time communicated.

For their information a summary is given of a document recently received from the Academy of above mentioned learned body.

The works for which the prize is claimed, are in the first instance considered by a committee of the Academy, and at the end of 1890 the following works were by that primary judicial committee referred to a second committee for a report:

1. *Bertrand.* Calculation of Probabilities.
2. *Hæckel.* Treatise on Radiolaria, Syphonifera and Deep Sea Cornaceous Sponges.
3. *Hertz.* Notes on the Transmission of Electrical Impulses.
4. *Lie.* Theory of Transformation Groups.

As to the first, though of the highest value, the committee did not think it fulfilled the conditions of the bequest. The report on the others s as follows:—

"E. Hæckel's work contains descriptions of the radiolaria, siphonifera and deep sea cornacuspongiæ, collected by the "Challenger" in her voyages from 1873-1876. The naturalists on the "Challenger" made large and valuable collections of the organisms living in the depths of the Ocean, and the British Government entrusted to Hæckel the study of the above groups mentioned. In 1860 he had already made known to science a number of radiolaria, and in his monograph on calcareous sponges and medusæ, had laid the basis of a new branch of biological study—comparative morphology—and had indicated the fundamental properties of protoplasm. From 1860 to 1888 he continued his studies on radiolaria. To this epoch belong his writings on the considerations which induced him to establish the kingdom of the *Protista*—intermediate between the animal and vegetable kingdoms.

"In the first treatise offered for this competition, Hæckel increased the known species of radiolaria from 810 to 4,318, but beyond its importance to systematic zoology, we must consider the very great value of the anatomical and physiological portion of the work. The second relates to siphonifera. The delicate structure and the fragility of these animals, their life in colonies and the many instances of their polymorphism, render their study extremely difficult, and Hæckel's notes have great value, not only on account of the new forms described, but also for the general theory of their organisation, embryogeny and philogeny—and the concerted work of the individuals and the colony. In the third treatise Hæckel describes systematically the corneous sponges of the deep seas, studies them histologically, and treats generally of the position of this group, and the proper classification of the porifera. In this memorandum are described the most important phenomena of the structure of hydroids and sponges. The three treatises form a work of 2,300 pages, with 200 illustrations, drawn in great part by the author. They are undoubtedly the greatest work of the four years 1887-90, in respect of zoology, and acquire still more value as being part of a vast book through which the author, studying the fundamental phenomena of life, and the development and relations of organisms, has acquired the reputation of one of the greatest naturalists who ever lived, and has inscribed his name by the side of those of Linnæus, Lamarck, Cuvier and Darwin.

"We now pass to the works of Hertz. These are to the number of nine, and on account of their volume, but an imperfect account of them can be given.

"Although the number of electrical phenomena known and studied in all their particulars is very great, our knowledge of the nature of electricity and the internal mechanism of these phenomena is very limited. The influence of a body, electrified either by a shock or a current, is exercised upon distant bodies without our knowing how this influence is transmitted across the intervening space. Faraday was particularly interested in this subject, and used certain devices for representing the condition in which electrical magnetic influence might in such a case be exercised. Maxwell, availing himself of the powerful aid of mathematics, carried the study of the theory of the causes of electrical phenomena a step farther, and proved that the luminiferous ether was the means for transmitting electrical influence, and, invading the field of hypothesis, founded the electro-magnetic theory of light, according to which all the phenomena of light are thought to be electro-magnetic in their nature. Some proofs were found to favor this theory, but they were indirect and incomplete. *Hertz* proposed to study experimentally the propagation of electric impulses, and availed himself of the extremely rapid oscillations which occur when an electric discharge takes place in certain circumstances. Suppose, for example, a conducting body

electrified and put in connection with another not electrified, by a wire—when the wire fulfils certain conditions, the electricity, instead of distributing itself over the two bodies, and suddenly readjusting the equilibrium, rapidly oscillates from one to the other body, and does not equilibrate till after a great many such oscillations. By ingenious experimental arrangements, *Hertz* succeeded in shewing that electrical impulses, to which these oscillations give rise in surrounding space, propagate themselves with a definite velocity, and this was the first direct confirmation of the ideas of Faraday and Maxwell, that electrical activity could be transmitted between two bodies without interposing a third. He showed that the propagation of these impulses on wires and through air took place in the same way as that of light and sound. He measured the velocity of that transmission, and found in air an equal velocity to that of light. He studied the reflection of electrical vibrations on metallic reflectors, and found in this respect again, complete analogy with that of light. He showed that in wires and in the air we could have continuous waves formed by electrical vibration, as in the case of sound. He made a great prism of insulating material, and demonstrated that a ray of electrical vibration made to fall upon one of its sides, was refracted like a ray of light. He found that the index of refraction of that substance was about the same for light and electrical vibrations. All these experiments came in wonderfully to confirm the electro-magnetic theory of light, and every one perceived the great importance of the labors of Hertz, in correlating and referring to the same cause two such important parts of physics—two such large classes of phenomena. Besides this principal consequence of the experiments mentioned, Hertz has arrived at other conclusions, among which may be mentioned the proof that electrical movements, occurring within insulating bodies, produce on external bodies electro-dynamic effects, and that the ultra-violet radiations determine the discharge from two bodies of different potential, when the difference of potential without the influence of these radiations is insufficient therefor.

"The theory of transformation groups, by Prof. *Sophus Lie*, of the University of Leipzig, is a work of capital importance, in which are gathered together the original researches which science owes to *Lie*, into the internal structure of groups of transformation in general, and especially those of contact. The results of such researches apply to analysis and differential equations in mechanics, as well as to various geometrical problems. The richness and value of the theories of *Lie* have been widely recognised. Illustrious French mathematicians, such as Darboux, Poincaré, Picard, Goursat, have published works based upon them, and refer to him with the greatest admiration.

"In preceding competitions, the committee entrusted with the final investigations, have placed the names of the authors in order of merit, yet, without having wished to dictate thereby how the Academy might be pleased to vote. In the present case the committee does not feel enabled to act in that manner—they have examined three eminent works, relating to different sciences, and present the three without any distinction of their merits. Your vote will determine which best answers the desires of the founder of the prize."

THE GREAT CENTRE; AN ASTRONOMICAL STUDY.

By J. C. Hamilton, LL.B.

(Read 6th February, 1892.)

The paper opened with a short review of the history of astronomy. With reference to the special branch of the subject, it summed up the teachings of Pythagoras, as to harmony in the movement of the spheres, and the central fire of Philolâus, around which the heavenly bodies were supposed to perform a circling dance. Farthest off were the fixed stars, then in order the five planets the moon and the earth.

The beautiful theory of the harmony of the spheres was not lost sight of by our great poet, as is seen in the famous dialogue between Lorenzo and Jessica, (Merchant of Venice, Act 5, Sc. I.)

Reference was made to the theory of the Great Centre by other poets, such as Edgar A. Poe, in "Eureka"; and Addison, calling it the "Heaven of Heavens," in No. 580 of the Spectator; Tennyson's last verse of "In Memoriam"; and Dryden's lines:

> "This place; the highest mansion of the sky
> I'll call the Palace of the Deity."

The "Mystery of the Seven Stars" was then discussed. As satellites revolve around planets and planets around suns, so the solar system moves around a grand centre. This holds good in regard to the constellations and known systems of the universe in an inconceivably magnificent extent. What that centre is may be asked. It was shown that strange reference to the Pleiades was made by Job; that the priests of Belus noted their rising and setting two thousand years before Christ, and astronomers point to this region as one of amazing majesty. The Greeks called them Pleiades and said they were the seven daughters of Atlas and Pleiône, of whom all but one, Meropé, were united to immortal gods and placed in heaven after death. Their names are Alcyoné, Meropé, Maia, Electra, Taygeta, Steropé and Celeno. The Greek name for the group has its origin ascribed sometimes to the word signifying to sail, as their rising was looked for by the sailors of the Mediterranean; but another derivation makes them the heavenly doves.

Our Mohawks have a legend as to the seven stars in which seven brothers who unfortunately fell in love with the same fair squaw, were translated to heaven on her untimely death. The Chippewas of Lake

Superior, with less romance, called the Pleiades *Madodisson* or the sweating stones, referring to the hot stones arranged in a group in their vapour baths.

Only six Pleiades are usually seen, though as many as sixteen have been made out by keen observers without artificial aid (Mr. A. M. Clarke's article on *The Pleiades, in Nature*, April 15, 1886, Vol. 33, p. 561.) Hipparchus mentions the possibility of discovering a seventh member of the group, Ovid too, "Quae septem dici, sex tamen esse solent."

The story of the "Lost Pleiad" is immeasurably antique and cosmopolitan as a myth or a tradition. The Pleiades are included in the great constellation of the Bull.

They are with us a winter constellation. Their position is best found by following with the eye the line made by the belt of Orion northward past Aldebaran and the Hyades.

Alcyoné is of the third magnitude, but was not 1750 years ago the lucida of the collection. The leading place was first assigned to Alcyoné by Tycho Brahe in the sixteenth century. Galileo detected nearly fifty stars in the Pleiades. M. C. Wolf, in 1875, at Paris, made a chart which included stars to the fourteenth magnitude to the number of six hundred and twenty-five, contained in a rectangle $135' \times 90,'$ in which Alcyoné occupies a nearly central position. By the photographic object glass, stars of the Pleiades down to the seventeenth magnitude have been deciphered, and more than one thousand four hundred have been placed on the photographic retina.

The Pleiades are immensely far off. None of them has any sensible parallax, nor are we informed of their intrinsic lustre, mutual distance or gravitating mass. Recent investigations of the structure of the Pleiades group shew a surprising miniature sidereal system, the richness and variety of which bewilder theoretical conceptions, and recall as anomalous the accumulated wonders of the Magellanic clouds. Groups are collected within the main groups, systems revolve apart, the subordination of which to the laws of a general federative union, leaves their internal liberty of movement unshackled.

The furthest of the suns forming the group are seventy-one times as distant from us as from the centre of their own system; consequently Alcyoné blazes upon them with five thousand times the brilliancy of Sirius. "It would seem," says Mr. Clark, "a star rather than a sun."

A learned Canadian, of eminent name and lineage, Mr. R. G. Halibur-

ton, Q.C., F.R.G.S., now residing abroad, has made a study of primitive traditions as to the Pleiades. He has discovered a yearly calendar regulated by these stars. He has become known in connection with the so-called "Pleiades Year." A work published on the Continent "Die Pleiaden," has been dedicated to him as the pioneer in this interesting field of research, and Mr. Piazzi Smith, late Astronomer Royal of Scotland, borrowed largely from Mr. Haliburton in his book on the Great Pyramid.

Mr. Haliburton has long been promising to embody the result of his investigations in book shape. Failing this, I am, through correspondence and reference to his published essays, able to give some of the facts and observations. And so, without too much anticipating the promised story, which we will hail with pleasure, I will cull from the rich supply he lays before us.

In his pamphlet entitled "New Materials for the History of Man, 1863," Mr. Haliburton shows that the Festival of the Dead was, in ancient times, regulated by the Pleiades. The memory of the Deluge was by the Mexicans, the Egyptians and the Jews associated with the same time of the year—the middle of October. Among the Aztecs, as well as the Egyptians, the Deluge was commemorated at the beginning of the year of the Pleiades, that is when that constellation culminated at midnight. The Deluge and time were considered synonymous by the ancients. In Europe the last day of October and first and second of November are designated as the festivals of *All Hallowe'en*, *All Souls* and *All Saints*. They are connected with the commemorations known amongst all nations as the Festival of the Dead or the Feast of Ancestors, and this reminds us of the Voyage of Ulysses to the Gardens of Alkinoos, the abodes of the dead. . . . The Pleiades long retained their name Hesperides, Stars of the Evening, even when they had ceased to regulate the year, when their pleasant influences had been forgotten. They were also by the Latins called Vergiliæ or harbingers of the spring; and by the Hebrews *Chimah*, or the *Cluster or group of Stars*. The Pleiades gain twenty-eight days on the tropical year in every two thousand years. Hence the Pleiades that now culminate at midnight on 17th November, did so in October two thousand years ago. The Bull constellation including the Alcyonic group, bore the name Tar, Ataur and Attyr in Egypt. Hence the Latin *Taurus*. The year of the Tar and stars of Attaur, have left their impress on the very mountains of Great Britain. Many a hill is known as a Tor. Our ancestors raised the "Seven Altars" on these hills to the stars of the Tar, and to this day the pleasant influence of the Pleiades, commemorated by Job and celebrated by

Australian savages, is still lingering in Britain under the popular traditions as to the good King Arthur. It is worthy of note that the name of this king meant in Egypt a hill, (Bunsen's Egypt, I., 465.)

The era when the Pleiades left their impress on the calendars and traditions of nations, must, says Haliburton, in *Nature*, Vol. 25. 100, be very remote, so much so that such researches are like investigations into the fossils that tell of organisms that lived in a world and breathed an atmosphere different from our own. He found a tradition on the African Gold Coast, that the Pleiades are young women, six of whom are very beautiful, but the seventh is so plain that she conceals herself from sight.

Some tribes of the Australians dance in honour of the Pleiades, because "they are good to the black fellows." The negroes too, say "these stars are good to the darkies." The natives of both North and South America regard the Pleiades as beneficent stars, and dance in their honour. M. Mädler, of Dorpât, in 1846 developed the theory that Alcyoné, the lucida of the cluster, is the centre of gravity of the solar system, the luminous hinge around which our sun and the planets move through space. The theory had been mooted by Wright in 1750, and Lucretius had some fanciful notion as to our system revolving around a common centre: Lib. 1, de rerum Natura. "The theory of Mädler, that Alcyoné, the brightest of the group is the central sun of the universe is most interesting," says Haliburton, on account of the fact that such was the actual belief of early ages. "The ancients in very remote ages undoubtedly believed that it was the centre of the universe, and that Paradise the primeval home of our race and the abode of the Deity, and of the spirits of the dead, was in the Pleiades, traces of which ideas we even find among savages."

With the Pleiades two sacred birds were connected. In Samoa there is a sacred bird called Manu-lii, the bird of the Pleiades. The Hindoos believed that Brahma came from an egg. The Greeks had similar traditions; Castor and Pollux sprang from an egg. So also Semiramis, and she was brooded over by a peliad or dove.

From Britain to Japan these stars are popularly known as the "Hen and Her Chickens," and the "Hen-Coop." In Mexico the Kingfisher was a sacred bird; so with the Greeks it was called the Halcyon, the bird of Alcyoné or Paradise; and the Halcyon days were the summer days at the end of autumn, which we should now render heavenly days. Mr. Haliburton found that among the Brahmins of Tyroloc, the name of November was *Kartica*, the month of the Pleiades. In Polynesia there was a year regulated by the rising of the Pleiades at the sunset, and their

being visible all night long. He also found a three days' feast observed in Australia in honour of the Pleiades, and traces of the primitive Pleiades calendar he has discovered existing all over the world. These stars are apparently six in number; yet among civilized and savage races in Europe, in India, China, Japan, Africa and America this diminutive group is not merely regarded as seven stars, but what is more surprising, as "The Seven Stars," though the far brighter stars of the Great Bear might seem to deserve the title. In the Feast of Tabernacles, the Berber tribes build their temporary tents with a hole at the top, in order that the young men being instructed, may see the Pleiades passing overhead. The Jews were found to have the same custom. "We can now understand," says Haliburton, "the vestiges in Egypt of a popular belief that the Pleiades are in some way connected with the Great Pyramid, the existence of which was observed with feelings of surprise by Prof. Piazzi Smith."

Colonel Vyse is credited with noticing this phenomenon when making researches in Egypt some years since. Six of the pyramids at Gizeh have openings facing north, leading to straight passages which descend at inclinations of from 26° to 28°, the direction being parallel to the meridian. A person standing at the bottom and looking up, would have seen the Pleiades passing overhead when the Great Pyramid was built in 2170 B.C. Prof. P. Smith suggests that its seven chambers commemorated the seven Pleiades.

The Berbers of Morocco had a name for Alcyoné which was given because they said Paradise is there, and the Pleiades are the centre of all things. In Sahara are ancient mosques and temples where the year is still regulated thus, there being a tube from the top of the building, small above and larger below, through which the southing of these stars is observed.

"I am persuaded," says Haliburton, "that the day is coming when the learned will admit that these stars are the 'Central Sun' of the religious calendars, myths, traditions and symbolism of early ages, an era however so marvellously remote that investigations respecting it bear the same relation to the study of anthropology and to the science of religion, that paleontology does to natural history."

The essayist said in concluding: We have now reached as far in our enquiry as time will permit. It is admitted that it is still one of theory and speculation in advance of demonstrative and practical astronomy. Among objections to the selection of Alcyoné as Stellar Queen, may be that she is not of first astronomical rank, but of the third magnitude, while all the

others of the group are of lesser apparent proportions. Some may suggest the great Aldebaran or Sirius the immense central sun, or perhaps Arcturus, with a diameter exceeding ninety millions of miles. Could he be placed between our orb and the sun, he would fill nearly all the intervening space. Yet as we have seen, the old Chaldeans, the Egyptians, the Berbers of Morocco, savage myths and folk lore, Job and the poets point to the same great centre. The inference is boldly drawn that a spot so comparatively small and insignificant as our planet, or even the solar system compressed into one great mass, cannot with reason be regarded as the future place of bliss. If in that are to be gathered the mighty intelligences and the innumerable redeemed of all ages, the argument is advanced that Alcyoné, the great lucida of the group, the physical centre of the universe, may be also its spiritual and divine centre.

This, as we have seen, has some weight with men of science, but is mainly found as yet in poetic musings. Such may be included in the Laureate's conception of

> "One far off divine event,
> To which the whole creation moves."

THE ABENAKIS OF SAINT JOHN RIVER.

By Edward Jack.

(Read 23rd January, 1892.)

When Champlain landed at the mouth of the St. John River in the year 1604, he found a number of Indians living there. In answer to his inquiries as to what they called this river, he received this reply, Ouigoudi; now the name of St. John River in Abenaki as well as in Micmac is Wallostook, the word Ouigoudi meaning camping ground. Singularly enough this error has been continued down to our day, and one of the ferry boats which cross the harbor of St. John is called the Ouangondy, a corruption of the word Ouigoudi, arising from a misprint in a history of Nova Scotia in which the word was thus printed. Had the parties who thus misnamed this steamboat asked the Aborigines who were camped near the city, what they called the St. John, they would have received a correct answer. Lescarbot in his "Histoire de la Nouvelle France" says, that when in 1606 he came to the River St. John, "being in the town of Ouigoudi, for thus I can properly call an enclosed place full of people, he saw in a great thicket about eighty savages."

Just opposite the city of Fredericton also, there is a collection of mean huts in which some of the Abenakis of the St. John reside, this they to-day call Ouigoudi. At the time of Champlain's arrival, the banks of the St. John were inhabited by the Abenakis, a branch of the great Algonquin family; their descendants tell me that their ancestors came from the west, and that before the white men arrived among them they worshipped the sun and moon.

The Great Spirit was called by them Ketsi Niouaskoo, and the Evil Spirit Matsi Niouaskoo. One of my Indian friends said to me he had read about the latter in his catechism, and that he is the devil.

It is stated in the relations of the Jesuits that in the year 1642 some Algonquins who were attending a religious celebration at Montreal, having ascended the mountain, one of them pointing to the hills situated to the south and east, said to the French, that the Hurons who then were their enemies, had driven their ancestors from this country, some of whom had fled to the country where the Abenakis now live. The first

missionary to visit the St. John was Pierre Biard, of the Society of Jesus, who was sent to Acadia in 1610-11, through the exertions of the Duchess of Guercheville and other ladies of the French Court. Biard in a letter to Claude Aquavia says: "I beseech you by the merits of Jesus Christ to remember us and these most solitary countries, assuredly we are sowing in great poverty and tears, may the Lord deign some day to grant us a harvest of joy." In another: "Our days and nights flow sadly along, what consoles us is the hope that God who reanimates the downcast heart will shortly come in his mercy and assist us in our wretchedness."

In 1611 Biard ascended the St. John in company with Biancourt, and celebrated Mass on an island six leagues from its mouth. This island is probably one of those which are situated not far from what is now called Oak Point. According to Abbe J. A. Maurault, the Abenakis (men of the east) formerly inhabited what are now Maine, New Hampshire and New Brunswick, extending even as far as the shores of Nova Scotia. This tribe formerly consisted, according to him, of several divisions. He enumerates the following as being the chief:

1st. The Kanibesinnoaks, those who live near the lakes; these were called Canibas by the French.

2nd. The Patsuikets, those of the Land of Fraud, because there were among them many New England savages, who according to the Abenakis had established themselves by fraud on the Merrimac River, and extended themselves as far as the Connecticut; they were only one division of the Sokokis.

3rd. The Sokowakiakis, men of the south; these resided in the south-west part of Maine and in New Hampshire; the French called them Sokokis.

4th. The Nurhantsuaks, those who travel by water, because they resided on the upper part of the Kennebec, and on the shores of the lakes.

5th. The Pentagoets, who were also called Penaouabskets, those of the stony country; these resided on the Penobscot, where the shores were in many places covered by stone.

6th. The Etemankiaks, those of the country of snow-shoe hides; these resided on the River St. Croix and on the St. John. The Abenakis called this territory Etemandi, because there were here great quantities of moose and caribou, from whose hides excellent snowshoes were made.

7th. The Oualastegouiaks, these resided on the River St. John; later they were called the Mouskouasoaks, Muskrats, because they lived like these animals on the banks of the river. The remains of this tribe and those of the Etchemins are now called Melecites. These Indians now occupy the greater part of New Brunswick, and it is with them that the writer has to do at present.

Abbe Maurault gives the meaning of the word Malouidit as being those of Malo, which he says was the name given to the Metis among them, because the greater part of their fathers came from St. Malo. He also says that the Abenakis called the grain which was introduced among them by the French, Maloumenal, Malo grain. The early connection of the Abenakis with the English is shown by their word for king which is Kinzames, this evidently comes from that of King James, who ruled England from 1603-1625. This or a similar word is used for the name of Queen Victoria, as any one may learn by going into one of the Abenakis school houses, and asking the dusky little scholars who are very tractable and who excel much in writing. The chief settlement of the Abenakis on the St. John was at Augh-Pa-Hac, head of tide six miles above Fredericton, at the point where the still water meets the rapid. John Gyles, who was a prisoner among the Abenakis from 1689 to 1698, was taken to this place. About the first of July 1881, the writer being desirous of visiting the vicinity of Augh-Pa-Hac, all traces of which have completely disappeared, engaged one of the most intelligent of the Abenakis to pole him to the place in his bark canoe. Noticing a good chance to land and have our dinner, we went ashore near a cold spring; when the meal was finished, the Abenaki took out his pipe and enjoyed a good smoke. This made him more communicative than usual, for they are not a people who are fond of much talking. He said that "when the first white man came to St. Anne's Point just above Fredericton, he found an Indian sitting on a bench in front of his wigwam; the Indian motioned to the white man to be seated, and as the latter was taking his place on the bench the former out of respect moved a little away, then the white man moved nearer, until the poor Indian was pushed entirely from off the seat." I asked him why his people liked the French better than the English; in reply he said that "When the English took Quebec they promised to treat us Indians as well as the French did, but they never have and never will; the French lived among us, learned our language and gave us religion, they were just like ourselves; this is why we thought so much of them." After ascending the river for a mile or two more we came opposite the foot of what is now called Hart's Island; this the Abenaki said was formerly called Old Town by the Indians.

Here it was that the Abenakis lived in summer; their wigwams placed around the island formed a sort of stockade, the centre being reserved as a place for dancing. The Mohawks, he said, had often attempted the destruction of the Indians of the St. John, and once in particular they would have been successful but for an aged squaw, who was so wise that all the tribe listened to her opinions with respect. "One evening long before the whites had come among us," said my Indian whose words I give as nearly as possible, "this woman with her grey hair falling down over her shoulders, rushed into the centre of the encampment calling out "there is trouble, there is trouble;" she was soon surrounded by the anxious braves who wanted to know what she meant. Look at Wi-Jo-Sis, (Curry's Mountain) a hill on the opposite side of the St. John, back of it a great party of Mohawks are hidden, and they are only waiting for night to attack and kill you all, if you are not ready to meet them; a council was at once called and a course of action determined upon. Some old Indians call this mountain We-Jo-Sis Po-Te-Wis, or Little Council Mountain, because in old times the Mohawk braves always went there first to hold a council before attempting to attack the Abenakis on Nkarne-Odan (Hart's Island), they would stop on this mountain for days watching the Abenakis. In order to deceive the Mohawks, the Melicites concluded to have a big dance; while this was going on the braves one by one slipped out, leaving none but the old men and women to keep it up. Before leaving however, they had agreed upon a particular sign by which they could distinguish each other in the dark as they were crawling through the long grass, or among the thick bushes which surrrounded the island, and he who did not respond to this sign was to be dispatched immediately and his bleeding head to be thrown among the dancers. The Mohawks, as night advanced, stole along noiselessly to the Melicite village, but wile had been met with wile, and before day dawned many a Mohawk's head had been thrown among the dancers, with the whispered command, dance harder, dance harder. All of the Mohawk braves were slain, the others were killed as easily as you would cut a chicken's head off, or knock down a lamb. Some three or four had been reserved however, whose noses and ears were cut off and they were allowed to return home in order to show the Mohawks how they would be treated should they try the like again." As my friend had again thrown off all reserve and become talkative, I seized upon the occasion to note down what he said. I had been speaking about the food of the Aborigines. "You want to know what vegetables we used before the white man came among us; we will go over to the island, and I will show you the Indian potatoe; when I was a little papoose I remember coming here with my mother for them, I picked them up as she dug them with a hoe. We will find the

Indian potatoes here," said my friend, as he pushed his canoe ashore, landing at a spot shaded by alders, where he began to dig with his hands, and soon brought to light what seemed to be a lot of very small potatoes strung together at equal distances ; we wanted to see the plant of which they were the roots. After a good deal of looking among the tops of the alders, the Melicite brought us some leaves of the common bind weed, which had climbed up among them; it is of the same family I believe as the sweet potatoe. "There is another root," said the Melicite, "which our fathers used, we call it Indian rice, I often use it, it is very white and nice and is excellent in soup." From the description which he gave of the plant it must have been the yellow lily, which grows in rich damp ground on the shores of the St. John. "We use, in medicine, among other plants the root of the sweet flag (said the Indian). Long ago a great sickness fell upon the Abenakis, and many of their women and children died. One night there appeared to one of the braves a strange figure, as of a man all covered with joints and bars, I am, said he, Ke-Whis-Wask, muskrat root, (the Indian name for the sweet flag), and can heal you all; dig me up, steep me in water and drink me, and I will cure you. After saying this he disappeared, and the next morning, the brave doing as he was told, all of the sick on drinking it, recovered." Leaving the island where we were shown the Indian potatoe, as the Melicite poled his canoe towards Savage Island, the water became quicker, there, said he, pointing to the west side of the St. John River, is Augh-Pa-Hack, and here once stood our church and village, the English destroyed them long ago. Pointing towards Savage Island he continued, "There was in former times on this island a race course, which extended all around it; here after ball playing the young Indians tried their speed, I have seen when a boy, marks of this race course in the sod. In old times the young Indians were carefully trained, they were kept by themselves and everything was done to make them strong and supple. The Indian boys were every day practised in the use of the bow, by some old man whose duty it was, so that at fifteen years of age they became good hunters, the old teacher having taught them how to make traps and catch game of various kinds. The young Abenaki was not allowed to choose his own wife, the parents did this; when they saw a young squaw who was considered a suitable match for their son, they sent bracelets and a piece of wampum to the girl. Her relatives then met and consulted over the matter, and if the match was approved of the presents were kept, if not, they were returned." (The old Abenaki who gave me this information, said to the writer), "My old woman and I never spoke to each other before we were married, my father and step-mother made the

bargain. I think young people are getting too saucy now, for they must do a great deal of talking before they can get married."

"Indian corn," said my Abenaki friend, "was once grown to a great extent on Savage Island; when the grain was ripe the corn on the cob was hung up to dry in the wigwams, and when dry enough was removed from the cob and placed in baskets, which were set away for winter use; when used it was sometimes boiled whole, and at others cracked by hand between two stones, after it had been cracked it was put in a pot and boiled with sturgeon or salmon roes until it was very soft, this food was eaten out of wooden bowls with wooden spoons. After the corn was cracked it was called Nsabon. Before making this boiled food, the hulls had been removed by boiling the corn in lye, after which it was washed in pure water. The boiled food was called Qunosk-ke-te-ga-ne Nsabon, in English, boiled corn pudding. Augh-Pa-Hac was a famous place for salmon and sturgeon in old times, they were caught in July, the roes were saved and hung up in the sun to dry, they were afterwards smoked. When dry enough they were rubbed by hand so that the eggs separated, the product was then put in birch bark boxes and hung up in the wigwam." Cadillac, the founder of Detroit, mentions that when ascending the St. John, he found the Abenakis of Medoctet, or Meductic, cultivating pumpkins, corn and beans. Medoctet was a famous Indian encampment, it was situated on the west side of the St. John on a rich flat, a short distance above the mouth of Eel River, and it was this river that the Abenakis ascended when they made their raids on Massachusetts. There was another Abenaki village on the Saint John River, just below Edmundston, the northern terminus of the eastern division of the Canadian Pacific Railway. The Recollets had a mission at Augh-Pa-Hac in 1620, and in 1696, Father Simon, the missionary at that place, sent down forty of his Neophytes to aid De Villebon in his defence of Fort Naxoat, situated at the mouth of the River Nashwaak, and nearly opposite Fredericton, at the time when that fort was attacked by the New Englanders, who were always ready to harry and annoy either French or Indians. This disposition was no doubt the cause of the Abenaki emigration to the province of Quebec. The first that we hear of them in that province was in the year 1637, when some of them came to Quebec to buy beaver skins. Evincing an intention of ascending the St. Lawrence still further, they were forbidden by a Montagnais chief, but notwithstanding this they went as far as Three Rivers, in order to trade with the Algonquins. The Montagnais chief complained against them to the governor M. De Montmagny, representing to him that these Indians had come to Canada in order to buy beaver skins to carry to the English. The wigwams of the Abenakis were visited, and the articles

which they had received in exchange for their wampum were confiscated, and they were enjoined immediately to return to their country. In 1640 an Englishman accompanied by twenty Abenakis arrived in Canada; the Governor on being informed of this, forbade him from visiting Quebec. As the rivers by which he had ascended to the St. Lawrence were too low to return, he was taken to Tadousac, and put on board of a vessel which was about sailing for Europe. Some time after the Abenakis were returned to their own country. At this time they were looked upon as strangers, and the favour of residing in Canada was granted only to a few who remained at Sillery, in order to attend religious services there. Charlevoix, in his History of New France, says that the French could not have maintained themselves in Canada without the assistance of the Abenakis, that in Acadia they formed their principal bulwark, and constituted an impassable barrier between New England and the French Colony, and that they were at length placed in Canada on the Rivers St. Francis and Becancourt, in order to create a barrier against the Iroquois, and to avert their irruptions. The chief immigration of Abenakis to the St. Lawrence took place not far from 1680; no doubt the causes were various. In the first place they and the French were co-religionists, and the latter were very glad to have their assistance as warriors. We hear of them in 1695 capturing a party of Iroquois on an island in Lake Champlain. After the victory they named this island Atepsec, the island of the head, because the Iroquois when surprised by them, had been gorging themselves on a bull's head, which they had roasted. Though firm friends of the French, the Abenakis could speak plainly to them when they deemed it necessary. Thus we find that in 1717 when an embassy was sent by some of them in Acadia to wait on the Marquis De Vaudreuil in order to ascertain whether he would help them against the English in case of a rupture, "What assistance will you give us, father," they asked; "my children," said Vaudreuil, "I will send you secretly some hatchets, and some powder and lead." "Is this the way then," the Indians retorted, "that a father aids his children, and was it thus that we assisted you? A father," they added, "when he sees his son engaged with an enemy stronger than he is, comes forward, extricates him, and tells the enemy that it is with him that he has to do." "Well, replied De Vaudreuil," "I will engage the other Indian tribes to furnish you with aid;" at these words the Abenakis retorted with an ironical laugh, and said, "know that we who inhabit this vast Continent will whensoever we please, so long as we exist, unite to expel all foreigners from it, be they who they may." This declamation surprised the Governor, who to pacify them said, that rather than abandon them to the English, he would march at their head.

THE TRADITIONS OF THE ABENAKIS.

The Indians of the St. Joh nRiver have a vast number of traditions; some of these agree exactly with those which I have heard from the Chippeways on the head of Lake Superior, and a comparison between those common to the two tribes would form a most interesting study. Among uneducated people oral traditions form their history and literature, and hence it is that one hardly meets with an old Abenaki who has not a vast number of stories of various kinds relative to his people, as to those mysterious and shadowy beings which his ancestors taught him were to be found in the forests or around the lakes; a favorite situation for the dwelling place of these spirits was the top of some lofty mountain, the more inaccessible the better it suited the purpose. The Indian who in former years wandered solitary through the vast forests among which the St. John winds in its course to the sea, was forced to commune with his own mind; if the deep voiced thunder bellowed or the lightnings flashed, the more easily impressed among them heard in this the voice of the Great Spirit. He may have said on his return from his hunt that the Great Spirit had spoken to him, adding to what he had heard the creations of his own heated imagination; the story being retold by the listener was added to by him, and thus by a series of increments these traditions have been built up to a perfect story, just as the larger crystal is built up on and around its primitive molecule. In a short and imperfect sketch such as the present one is, I give only a few of these traditions, and they are given in a very disconnected manner, but as nearly as I can in the language of the narrators as taken down from their own lips. The most prominent character in all the traditions of the Abenakis of the St. John is Glooscap. They tell me that the traditions respecting Glooscap they received from the Micmacs, and that the language which the Turtle, Glooscap's uncle, spoke was Mic-mac. Glooscap was a twin, his brother burst his way out of his mother's side, after they had grown up his brother became jealous of Glooscap and determined to kill him. In conversation with him one day, Glooscap's brother casually asked him what would kill him? Glooscap, knowing his brother's evil thoughts, did not tell him the truth, but said to him that a blow from the down which forms the head of the bullrush would do it; and "what would kill you?" said he to his brother. "A bird's down," was the reply. As soon as the younger brother could get a bullrush he picked off some of the down and threw a handful at Glooscap's head, it knocked him over and he remained stunned for a long time. When he came to himself and knowing that his brother was very dangerous and wanted to do all the evil he could, he determined to get rid of him, which he did by

striking him with some bird's feathers. One of the most intelligent of the Melicites in conversation with me said, "there must be something in Glooscap, for have I not seen his pack where he left it, which is now turned to stone? This is on the seashore below St. John. I have seen too the entrails of the moose which he killed near Machias; these are all twisted and are of white rock; then there is his head on the banks of the St. John." One evening I asked this man to tell me all about the famous Glooscap, and committed his words to writing, they were as follows:— "Glooscap is a spirit, he does not grow old, he lives at the south end of the world, the wild geese were his watchers, and the loon and wolf his dogs, there were seven Indians who once went to see him in order to get their wishes granted; they found him living with his grandmother, whose youth he had renewed four times. When these seven men came to where Glooscap was, and it had taken them seven years to reach him, one of them said to him, I want long life; telling him to come out of the wigwam, Glooscap took him to a spot near by, saying, stand there, you will get your wish, and then turned him into a cedar tree, all limbs and fit for no use, so that no one would ever cut him down. Glooscap is constantly making arrow heads preparing for a general war, he always looks young; where he is there is a medicine man who is blind, he lies on one side for seven years, he is then turned over and where he lay, herbs, good for medicine, were found growing. The benefits of these were explained by him. Glooscap asked this medicine man what he would do in case of a general war, he said that when all were dead he would open his eyes. When Glooscap's visitors were ready to leave, he pointed to the remainder of them a way of return which led them home in four days. Glooscap was very good, anything which was big and dangerous he reduced in size. One day he met the squirrel then an animal of great size, and asked him what he would do if he met a man; there was a stump close by, at this the squirrel rushed and tore it down with his teeth and claws, then Glooscap put his hand on the squirrel's back three times, and reduced him to his present size. In former years Glooscap had a camp as large as a big city, in this were all kinds of animals, even to the toad, and such power had he over them that he made them believe that they were human beings. The eagle (kulloo) was there, whose wife was the caribou, he had a son and daughter by the caribou, this daughter married the Turtle, who was Glooscap's uncle. Soon after this, Glooscap told his uncle to make a feast; "how can I do it?" said the Turtle. "You ought to be old enough to know yourself" said Glooscap, telling him at the same time to go down to a long point which ran out into the sea and wait until a whale came along, this he was to catch and carry to his father-in-law's house; soon one came swimming by, this he caught and towed ashore, putting it on

his back he carried it to the place named, but thinking that he could carry it further, had only advanced a little when he found the weight of the whale pressing so heavily upon him that he could not move. The other animals in terror came to Glooscap and told him what had happened, he said to them not to mind but to cut up the whale, this they did. Then the Turtle came out stretching his legs and saying that he was tired and sleepy, the great load which he had carried made the Turtle very proud, so that he began to hold councils on his own account with the other animals; at one of these he proposed that Glooscap should be killed and he become their ruler. All the animals even to the toad took part in these councils. Glooscap in order to defeat the tricks of the Turtle turned himself into an old squaw and made his way to the council house. At the door he found another squaw in the shape of a porcupine, she was sitting on one side while a toad sat on the other. Glooscap said to the porcupine what does all this mean? it is none of your business was the reply, so Glooscap took the porcupine's nose off between his fingers, and turning in a rage to the toad and making the same inquiry and receiving the same reply treated it in the same manner. As soon as Glooscap was gone the porcupine said to the toad, where is your nose? at this the toad looking at the porcupine said, where is yours? they were then satisfied that it was Glooscap who had been talking with them. After the council was over the Turtle said in a friendly manner to Glooscap, we will sleep together to night. After they had gone to bed and when the Turtle thought that Glooscap was asleep he attempted to stab him, but only wounded himself. At this Glooscap jumped up saying, let me have a cut at him, and wounded the Turtle badly; after this the animals all got fighting with one another, the Turtle quarreling with them all. One of them at last said to Glooscap, the Turtle will kill us all; then help yourselves by giving him a kick in the breast whenever he becomes troublesome. They did so and he appeared as one stunned. After this Glooscap called all the animals to him and transformed them to men and women. The wolf ran off and the loon flew away, both sorry enough to leave their master. When the Turtle came to his senses, seeing no one, he said I will return to my natural life, and retreating to the water he has remained there ever since."

The Melicites have many legends regarding Glooscap. There is a place about half a mile below what is known on the St. John River as Boar's Head; here they point out what appears to them to be the form of a man's head; this they say is Glooscap's image in the rocks, and they note this as the place where he first came to the St. John on his way down to kill the great beaver who had built a dam at the falls close to the city of St. John, where the suspension bridge now

crosses the river. They say that after breaking down this dam, Glooscap drove the great beaver which had constructed it, far up the river. The Tobique Indians point out some ledges which are known as the Tobique rocks, as being part of the stones which Glooscap pelted this beaver with; they also say that he subsequently took refuge in Temiscouata Lake, and that the high hill on its shores opposite the mouth of the Cabano is the house which he built after having been driven up the river from the mouth of the St. John. The Abenakis call the rocks between which the river passes into the harbor of St. John, Gtchi-quaabeet-a-wi-cup-a-hegan, which means, great beaver's dam. Within the memory of the writer, the Abenakis when passing Glooscap's Head, before mentioned, on their way out to sea, would throw figs of tobacco from their canoes into the river as votive offerings to Glooscap, in order that he might vouchsafe to them a pleasant voyage and grant them a safe return. Denny, who held extensive rights in Acadia about the middle of the 17th century, mentions a remarkable tree which was floating around below the falls at the mouth of the Saint John, and which had been there for a very long time; this he says, "the Abenakis called the Manitou, that is to say the devil, the homage which they formerly rendered to it was one or two beaver or other skins, which they fastened to it with an arrow head, made of moose bones, which they sharpened by means of stones. Afterward, when they were passing through this place and their Manitou did not make his appearance, they held it as an evil omen, saying that he was angry with them. Since the French have been in these parts and have furnished them with iron arrow heads they use no others, and the poor Manitou has his head so covered with them that one can hardly stick a pin in it. I have seen it, and M. De La Tour's men who were with him, and afterwards with me, have assured me that they once fastened ropes to this tree, and that with a ten oared boat rowing with all of their strength and with the current, they could not drag it out of the hole."

There are many other traditions among these people, respecting "Lox," "Micumwes," "Kulloo," and many other creatures of their imaginations, which may form the subject of a future article.

CELTIC PROSODY.

BY NEIL MACNISH, B.D., LL.D.

(*Read April 16th, 1892.*)

Though Celtic grammarians, such as O'Donovan in his excellent Irish Grammar, have devoted a section or chapter to the versification of the language with which they are dealing, it is very much to be regretted that, so far as I know, no separate or convenient or exhaustive book or treatise on Celtic Prosody has hitherto appeared. The Celts are *serius docti* in more respects than one. As so much praiseworthy attention has been directed in recent years to Celtic Literature, and as several Celtic Chairs have been founded, it is to be hoped that some Celtic professor, who can command sufficient leisure, will prepare, for the benefit of all lovers of Celtic lore, a Celtic Classical Dictionary, wherein will be lucidly arranged and detailed all that can be gathered from the ancient poetry of Scotland and Ireland and Man, and from the annals of Wales and Cornwall and Armorica, respecting those heroes whose names occur in the more ancient Celtic poems as well as respecting the places and customs of which frequent mention is made in those poems. It is to be fondly hoped that among our Celtic scholars there will soon appear a Lempriere, or a William Smith, who will prepare a Classical Dictionary of Celtic Biography, Mythology and Geography; and also that a Hermann, or a Bentley, or a Ramsay, will speedily appear who will prepare, for the benefit of Celtic scholars and all lovers of Celtic poetry, a full and lucid treatise on Celtic prosody. To the construction of Celtic poetry Zeuss has devoted a *Caput Alterum*, in which he exhibits his well-known learning and thorough acquaintance with even the oldest and most obscure fragments of Celtic poetry. He writes strongly in praise of Celtic prosody, for he thus terminates his examination of it: "By the oldest as well as the most recent examples that have been adduced, it appears that the form of Celtic poetry is more adorned than the poetic form of any nation, and that the ornamentation is greater in the older poems themselves than in the more recent. In consequence of that greater adornment it has doubtless come to pass, that even from those times at which the Roman Empire was rushing to destruction, the Celtic form, at first in its entirety, and subsequently in part, was taken over not only into the Latin poems but also into the poems of other languages and remained in them." Matthew Arnold whose fame as a literary critic is great, has these warm

words in praise of Celtic poetry: "The Celt's quick feeling for what is noble and distinguished gives his poetry style, his indomitable personality gave it pride and passion, his sensibility and nervous exultation gave it a better gift still, the gift of rendering with wonderful felicity the magical influence of nature. Rhyme itself, all the weighty evidence tends to show, comes into our poetry from the Celts." The Rev. Thomas Price, whose bardic name was Carnhuanawc, says of Aneurin one of the poets of his own country—Wales, "that English poetry was greatly indebted to him." Mr. Price further asserts not only that the admirers of poetry are under obligation to the ancient British bards, but that much of the refinement of civilized life is more intimately connected with the traditions and history preserved by them than may at first be apparent."*

It is certainly very gratifying to have the commendations of scholars of the erudition and critical ability of Zeuss, Arnold and Price, in favour of the value which attaches to Celtic versification in itself and in the peculiar characteristics of it, apart altogether from the claims which it has on the attentive study of the Celtic scholar. It is a mere truism to state that unlike Greek and Latin poetry where scansion depends upon the quantity of the syllable or syllables that form a word, scansion is regulated in the Celtic language by accent and not by quantity, by the stress of the voice and not by the length or shortness of the syllable or word. Such feet as the Iambic, and Trochee and Dactyl are common to Greek and Latin and to the Celtic languages. There must be some correspondence between those feet and the natural manner in which the human heart expresses its thoughts and feelings. Grote contends that "great as the power of thought afterwards became among the Greeks, their power of expression was still greater. In the former, other nations have built upon their foundations and surpassed them, in the latter, they still remain unrivalled." Horace expressed the truth very distinctly, when in reference to the influence which Greek poetry and Greek versification had on the poetry of his own nation, he wrote:

Graecia capta ferum victorem cepit et artes
Intulit agresti Latio.

In his *Treatise on Poetry*, Aristotle says that the Iambic metre was so named, because it was the measure in which people used to satirize each other. The Iambic is of all metres, he contends, the most colloquial as appears from the fact that our common conversation frequently falls into Iambic verse. Müller in his Literature of Greece thus writes (vol. I., p. 181): "The Iambic by proceeding from the short to the long syllable

* Price's Literary Remains, Vol. I, p. 107.

acquires a tone of strength and appears peculiarly adapted to impetuous diction and bold invectives, while the Trochee which falls from the long to the short has a feeble character. Its light tripping movement appears peculiarly suited to dancing songs, and hence besides the name of *Trochaeus*, the runner, it also obtained the name of *Choreius*, the dancer."

Zeuss correctly observes, that from the Greek and Latin nations whose poems are contained in a metre either by a settled calculation or by an order of long or short syllables, other nations belonging to the Indo-European family such as the Germans and Celts differ, inasmuch as all their poetry is founded on the agreement of sounds as well in the first as in the last syllable of words. Some races belonging to the Indo-European family, employ alliteration, and have two and three words in the same verse—words that begin with the same consonant or vowel. Other races have followed the agreement of sounds not only in the beginning but also in the middle and end of words. These peculiarities obtain in the case of the ancient Celtic poems. Davies in his *Examination of the Claims of Ossian* (p. 199) avers, that if we may judge of their verse by the oldest specimens which can be produced by their descendants in Ireland, Scotland, Wales and Cornwall, the Celts carried their art no farther than to adjust the number and cadence of syllables in each line, to add the embellishment of strong and impressive alliteration and to connect their verses with final rhymes which were sometimes continued without variation for several lines together. Davies goes on to say, that to assist the memory nothing could have been more conducive than the strong alliterations and long continued rhymes which we find in the Old Welsh Bards. The very sound of one word suggested the succeeding, and one line gave the echo of another. It must have been for the same purpose of assisting the memory, that these Bards frequently began several periods with the same phrase, and several successive lines with the same letter. Upon the whole it appears that the mechanical correspondence of articulate sounds, however differently understood, is the great principle of Celtic verse in general, and that the obvious correspondence of sounds naturally similar was attended to, before the Bards thought of that which is more complex and artificial." In his Introduction to his *Beauties of Gaelic Poetry*, Mackenzie correctly contends "that though much of Gaelic poetry might be scanned, a great deal of it cannot be properly subjected to the classical test by the most ingenious, and yet a Celtic ear will tell that it is good. The rules for scanning by which Latin verses are governed, are alien to the Gaelic, which certainly does not owe the art of poetry to the Romans. The concord does not always depend on the coincidence of final words, but rests on some radical vowel in corresponding words ; and these not terminal alone, but recurring in several

places throughout the verse." Stephen, in his Literature of the Kymry (p. 480) properly observes "that the works of the Cambrian Bards should not be judged by the critical principles which now prevail. Those Bards, according to an old authority, preferred, beyond all rhetorical ornaments, the use of alliteration and that kind more especially which repeats the first letters or syllables of words. They made so much of this ornament in every finished discourse that they thought nothing elegantly spoken without it." Alliteration, therefore, is one of the peculiarities of Celtic poetry. The writer of an article on *Alliteration*, in the Encyclopædia Britannica, remarks "that as Milton defines rhyme to be the jingling sound of like endings, so alliteration is the jingle of like beginnings." Churchill describes himself as one who often, but without success, had prayed

"For apt alliteration's artful aid."

Coleridge furnishes a good example of alliteration when he says,

"The fair breeze blew, the white foam flew,
The furrows followed free,
We were the first that ever burst
Into that silent sea."

The Welsh poet Llywarch ab Llywelyn furnishes many beautiful examples of alliteration, *e.g.:*

Teyrnllu, teyrnet teyrnllaw teyrnllin
Teyrnllyw teyrnas ternyse torment.

The incitement to valour which Ullin gives to Gaul in the fourth Book of Fingal, affords a good illustration of the manner in which Ossian practised alliteration, *e.g.*:

Lamh threun 's gach cas cridh 'ard nach geill,
Mar thorunn biodh do lamh, a laoich,
Do dhearg—shuil mar chaoir a' d' cheann,
Mar charragh cruaidh do chridh a' d' thaobh.

In Duncan Ban Mac Intyre's Beinn Dorain, alliteration appears to fine advantage, *e.g.:*

Gu stobanach, stacanach,
Slocanach, laganach,
Cnocanach, crapanach,
Caiteanach, romach,
Pasganach, badanach
Bachlagach, boidheach.

In his Oran Ghlinn-Urchaidh this excellent specimen of alliteration occurs:

Cinnidh arbhar craobhach ann
Cho caoin gheal ris a' ghruth,
Gu reachdmhor biadhmhor, brioghmhor,
Trom, torrach, liontach, tiugh.*

In the first verse of that extract *cinnidh* and *craobhach* begin with the same letter, *c*; *arbhar* and *ann* begin with the same vowel, *a*. In the second verse the initial *c* of *cinnidh* and *craobhach* in the first verse occurs in *cho* and *caoin*; *gheal* and *ghruth* begin with the same letter or letters *gh*. In the third verse the two last words begin with *b*, and the three last words end in the same syllable *mhor*. In the last verse *trom*, *torrach*, *tiugh* begin with the same letter. *Ach* forms the termination of *torrach* and *liontach*. In a section which he has entitled *Consonantia Latina*, Zeuss shows how the peculiarities of Celtic poetry found their way into Latin poetry, and influenced it to an extent of which many Celts have no adequate knowledge. St. Ambrose, Bishop of Milan, composed hymns in Iambics into which he introduced the concord or correspondence (consonantia) which obtains in the ancient Celtic poetry. A variety of vowels that agree among themselves is allowable. The demands of correspondence are satisfied by such terminations as *us*, *is*, *es*, *as*, and *im*, *am*, *em*.

Lucan in the opening of his Pharsalia has alliteration, and concord, *e.g.*:

Bella per Emathios plus quam civilia campos
Iusque datum sceleri canimus populumque potentem.

In the first verse which has been cited, the last two words begin with *c*, and the third, fourth and last words have correspondence, while the same thing obtains in the case of *Bella* and *civilia*. In the second verse, the first two letters in *populum* and *potentem* are identical. There is a correspondence between the *que* of *Iusque*, the *i* of *sceleri*, and the *que* of *populumque*, and between the *um* of *datum* and *em* in *potentem*. St. Ambrose composed his hymns in Iambic Tetrameters. While he is faithful to the classical requirements of his metre, he introduces the correspondence which he found in Celtic poetry, *e. g.*:

Somno refectis artubus spreto cubili surgimus
Nobis pater canentibus adesse te deposcimus.

Not only is alliteration present in these verses, the two last syllables of both verses terminate in the same manner, and there is a correspondence between the last syllable of the first Hemistich in each verse, *i. e.*, between

us in *artubus* and *us* in *canentibus*. Many scholars who are conversant with the writings of St. Augustine and with the very important contribution which he made to Patristic Theology, are in all likelihood not aware that he virtually effected a revolution in Latin poetry. Of his *Psalmus Abecedarius*, Zeuss affirms that, as if it were to open a new country and to announce a new age, it presents a novel form of poetry, inasmuch as in it metre and every calculation of tune are neglected and attention is paid to nothing save the settled number of syllables along with correspondence. Such are the circumstances which constitute the form of Celtic poetry, *e. g.*:

Bonos in vasa miserunt, reliquos malos in mare.

Here there is a manifest departure from the laws of Latin scansion, while the peculiarites of Celtic poetry are easily discernible. *Miserunt malos mare* begin with the same consonant, *bonos reliquos malos*, end in *os*. The last syllable of the *Psalmus Abecedarius* invariably ends in *e*. Secundinus, a relative of St. Patrick, adopted the model which was furnished by the Psalm of Augustine, and composed very many Latin verses in the same manner, *e. g.*:

Benchuir, bona, regula, recta atque divina,
Stricta, sancta, sedula, summa, justa ac mira.

In the first verse that has been cited, the first two words begin with the same letter ; the third and fourth words also begin with the same letter, and the second, third, fourth and sixth words terminate in *a*. The first four words of the second verse begin with *s*. Those words, along with *justa* and *mira*, end in *a*. The last two syllables of the first Hemistich in each verse terminate in *ula* (regula sedula); there is a correspondence between the last syllable of each verse, and *atque* in the first verse and *ac* in the second verse begin with *a*.

Davies thus writes (p. 215), "The structure of ancient British and Irish being one and the same, I cannot persuade myself that the Bards of either country deserted their own established mode to imitate that of the other. On the contrary I infer that they had equally retained the same mode from some remote age in which their ancestors had been better connected." As the result of his laborious investigation of the oldest specimens of Celtic poetry that are extant, Zeuss avers that the universal construction of poetic discourse was the same among the two divisions which he makes of the Celtic race.

Apud Hibernos vetustos et Cambros.

The first Irish Grammar that was printed was that of the Rev. Francis O'Molloy. It was written in Latin and was published in 1677. Lhuyd

transferred into his Archæologia Britannica a large portion of O'Molloy's Grammar, and especially that part of it which deals with Irish prosody. There is thus accessible to the Celtic student a somewhat full and certainly a very interesting account of the laws that govern the formation of Irish poetry in its older forms. O'Donovan has appended to his valuable Irish Grammar a chapter on versification, in which he apparently has expressed in more intelligible language the rules and explanations that are contained in O'Molloy's Grammar.

To understand the regulations by which Irish verse is affected, it is necessary to know the classification that the Irish poets were led to make of the consonants in their alphabet.

1. S was called the queen of consonants.
2. Three soft consonants: p, c, t.
3. Three hard: b, g, d.
4. Three rough: f, ch, th.
5. Five strong: ll, m, nn, ng, rr.
6. Seven light: bh, dh, gh, mh, l, n, r.

There are three kinds of verse in Irish, *Dan Direach*, *Oglachas* and *Bruilingeacht*. That the Irish poets must have possessed a large measure of ingenuity and intelligence in the composition of their poems may be inferred from the remarks of O'Molloy, who contends that the Dan Direach is the most difficult of all the metres that are found under the sun (quae sub sole reperiuntur.)

O'Donovan thus expresses the seven requisites of the *Dan Direach*.

1. A certain number of syllables in each line.
2. Four lines in each quatrain.
3. Concord.
4. Correspondence.
5. Termination.
6. Union.
7. Head.

Quartan is the term which O'Molloy uses to express one verse *i. e.* one verse of the four verses that go to form a Quatrain, or Rann Iomlan as it is called by the Irish.

The first couplet of the Rann Iomlan is called *Seoladh* or the leading.

The second is called Comhad or the closing. Concord or alliteration

(Uaim) requires two words (of which neither can be a preposition nor a particle), in each line to begin with a vowel or with the same consonant.

A proper concord or *Fior Uaim* obtains where the last two words of a line begin with a vowel in the same consonant, *e. g.*:

Triall tar Bearbha na sreabh sean.

An improper concord obtains when the words in question are *not* the last two in the line or verse.

Correspondence (Comharda) is of two kinds, perfect and imperfect.

Perfect correspondence is an agreement of two words in number of syllables, quantity of vowels and consonants of the same class.

An imperfect correspondence obtains when two words agree in the number of syllables, in vowels and in quantity, without any regard to an agreement of consonants.

Termination or *Rinn* requires that the last word in the second and fourth lines of a quatrain should exceed that of the first and third by one syllable. If, therefore, the first line end in a word of one syllable, the second must end in a word of two and if the third line should end in a word of two syllables, the fourth must be of three syllables. The first is called Rinn or the Minor Termination, the second Airdrinn or the Major Termination.

Union, or *Uaithne*, is the same as correspondence with the exception that the same vowels are not required in each place, and that in poly-syllables it is only necessary that they agree in class.

A *Chief*, or *Head*, or *Ceann*, is a monosyllable which concludes the second and fourth lines of a quatrain in that sort of verse called a seadna.

An *Amus* is much the same with an imperfect correspondence, from which it differs only in that it requires an equality in the number of syllables.

O'Molloy states that the initial word of the first quartan of a semi-metre is called an Urlann, which may indifferently correspond with its subsequent or not. He further states that the chiefest sorts of Dan Direach are five: *Deibhidhe, Seadna, Rannaigheacht mhor, Rannaigheacht bheag and Casbhairn.* To each sort whereof, the number of quartans, number of syllables, concord and correspondence, are indispensably requisite. In the *Deibhidhe* the major and minor termination are also necessary, as is likewise Union in Rannaigheacht *mhor* and Casbhairn, and *Chief* or *Ceann* in the Rannaigheacht bheag and Seadna.

Oglachas or the servile metre is made in imitation of all kinds of Da Direach which have been mentioned. An *Oglachas* is only a verse i imitation of those metres, and is confined neither to correpondence, con cord, union nor to true termination. *Droighneach* consists either of nin syllables in a quartan, or more, as far as thirteen, each quartan endin in a word of three syllables, and every final word must make a union wit another word in the beginning or middle of the next line or couple There must also be a correspondence between the final words.

Bruilingeacht is composed very much after the same manner as th *Oglachas.* It requires correspondence (at least improper correspondence and also a kind of *concord*, *union* and *head.*

The imperfect sketch which has now been given almost in the words o O'Molloy and O'Donovan, of the principal Irish metres, and the laws tha govern them, may suffice to show, that the ancient Irish poets were care ful students of the genius of their language ; and that they were led uncon sciously it may be, to adopt that method of versification and to frame thos rules of prosody, that suited the natural tendency of their own thought and the possibilities of the language, by means of which their thoughts anc feelings found expression in verse. Nor can it be otherwise than a pleasant and a profitable occupation to the Celtic student, to examine anc witness for himself how the Irish poets carried out the laws of Irish versi fication, and how they exhibited great ability and ingenuity in moulding their verse, according to the requirements of the various metres. The commendation is altogether too faint which Davies bestows upon the laws of Irish prosody. Puerile as some of those laws may appear, they were evidently the invention of a people who applied themselves closely to the study of letters. Nothing can be clearer than that the system of Irish versification is entirely different from the system of the Greek and Latin poets, and that a faithful adherence to the laws of their own versification demanded from the Irish poets no less ability and pains and musical culture than Sophocles and Euripides and Virgil and Horace displayed in the composition of their poems.

Shaw, whose Gaelic Grammar was published in 1778 thus writes (p. 132) "The measure of Ossian's poetry is irregular and various Generally he has couplets of eight, though they do not rhyme, and seven and sometimes nine syllables. These feet are most commonly trochee and dactyl. The trochee occupies the first, the dactyl the second, and third and a long syllable ends the line."

Davies was led to believe that Ossian and his poems belong to the Irish Gaels, and in accordance with his theory observed, (p. 196) "that

the measures of Ossian's poems are essentially the same as those which are found in the works of the Irish Bards; that these measures arise from principles which are developed in the grammars of the Irish as deduced from the practice of their national poets; that the application of these principles demands such a variety of punctilious grammatical observation as to render it evident that they were the invention of a people who studied the grammar of their own language; whereas the Highlanders, the only people who use the same language with the Irish, never reduced their native dialect to any grammatical rules before the year 1778. It follows that the measures employed in Ossian's poems are undoubtedly the invention of the Irish." The conclusion at which Davies thus arrives, in spite of his critical acuteness and learning, is untenable. Apart from the fact, that we are in possession of evidence as well internal as external to prove that Ossian and his poems belong to the Scottish Gaels, his poems do not fulfil the regulations of Irish metre to which reference has already been made. It was indeed to be expected that there would be, and that there is, very much in common between the versification of the Irish and Scottish Gaels, because the same language was spoken by them. The Gaelic poems of the Ossianic era are not written in quatrains, and cannot be made to assume that division without doing violence to the narrative and interrupting its natural consecutiveness. Smith's Sean Dana, the Gaelic originals of the poems which were translated by MacPherson, and MacCallum's collection of the poems of Ossian, may fairly be regarded as strictly Ossianic in their age and character and versification. The rigid laws of ancient Irish poetry cannot apply to those collections, though alliteration and correspondence and other features of Irish poetry are frequently to be found in them.

The authority of Price is of great value in connection with the nationality of Ossian. He thus writes, (vol. I., p. 168): "The Scottish Ossian is a totally distinct creation from the Irish Ossian, though the Celtic original is the common parent of both. When MacPherson published his poems of Ossian, the Irish immediately cried out these poems are our property, they are Irish, and we are in possession of the original manuscripts and will convince the world of the fact by publishing them. They did accordingly publish portions of their Ossian together with English translations; but their Ossian was no more like the Ossian of MacPherson, than the Nibelungen is like the Iliad or Paradise Lost like the Shah Nameh. It is true the names were identical, and many of the incidents, but the spirit was totally and irreconcilably distinct. The Irish Ossian excited no feelings but such as the world had long been familiar with, but the same work as interpreted by MacPherson called forth sentiments which till then had never been felt."

In Campbell's Leabhar na Feinne, there are many Gaelic poems which are arranged in Quatrains or in stanzas containing four lines or verses. Such poems, however, are manifestly of later date than the poems of Ossian. I am disposed to find an additional argument in favour of the Scottish nationality of Ossian and his poems, in the different complexion of his versification and in the absence from his poems of those rigid regulations which seem to lie at the very foundation of Irish poetry.

The opening verses of *Iom-Cheist Ghuill* in Smith's *Sean Dana*, for example, contain several of the peculiarities of Celtic poetry.

'S am bheileam fein am aonar,
Am measg nan ceuda colg;
Gun lann liomhaidh leam
'S a chath dhorcha.

Here we have very fair examples of concord and correspondence. A similar remark has to be made concerning the first verses of *Diarmad* in the same collection:

Cia tiamhaidh thu nochd, a Ghleann Caothan!
Gun ghuth gaothar thu 's gun cheol:
Tha suinn na seilg' an suain gun eiridh,
'S na filidh aoibhinn gun aon diubh beo.

Iarmbearla is a term which old Irish grammarians were wont to employ, to show that the *article*, *possessive pronoun*, *adverb*, *preposition* or *conjunction* coming between any two words, neither forms nor hinders a concord. Even when the most careful compliance with that regulation is given, it will appear that in the verses which have been cited, an improper concord obtains between *ghuth* and *gaothar*, between *suinn*, *seilg* and *suain*, and as some grammarians would contend, between *Ghleann* and *Caothan*. A striking peculiarity appears in those verses; for the last word of the first verse corresponds with the middle word of the second verse, *i. e.*, *Caothan* corresponds with *gaothar*, and *eiridh* the last word of the third verse corresponds with *aoibhinn*, the middle word of the last verse.

In *Caomh-mhala*, one of the poems of Ossian which MacPherson translated into English, these verses occur, exhibiting, as they do, some of the peculiar characteristics of Celtic poetry:

Taom, a Charuinn taom do shruth;
An aoibhneas an diugh siubhal sios;
Theich coigrich a b' airde guth.
Cha-n fhaicear an steud-each 'san t-sliabh,
Tha sgaoileadh an sgiath an tir thall.

Here a proper concord obtains between *siubhal* and *sios*, and between *tir* and *thall*. An improper concord prevails between *taom* and *taom; fhaicear* and *each*, *steud* and *sliabh*, *sgaoileadh* and *sgiath*. There is likewise a correspondence between *shruth*, *diugh* and *guth*, and between *sliabh* and *sgiath*.

The Iambus is the foot that enters most frequently into the poems of Ossian. It has to be frankly admitted that in scanning the poems of the Bard of Selma, a rigid adherence to the laws by which the poems of Greece and Rome are scanned, is simply impossible. Sometimes, by omitting the first syllable of a verse, as German scholars are wont to do in scanning the choruses of the Greek tragedians; or by omitting the the first two syllables as is the wont at times of the same scholars, it is possible to find purely Iambic feet in the other syllables of an Ossianic verse. With the aid, therefore, of an *anacrusis* or a *base*, the poetry of Ossian can be scanned as Iambics in very many instances. Trochees obtrude themselves occasionally in the middle of a verse, and even Dactyls make their appearance in the middle of a verse; so that to describe the verse as purely Iambic or Trochaic is out of the question. Though the poems of Ossian, having peculiarities of their own so far as prosody and scansion are concerned, refuse to obey the laws by which Greek and Latin poetry is scanned, the rhythm is of such a character that the cultivated Celtic ear can readily detect whether a verse or poem is Ossianic in its structure or not.

Miann a' Blaird Aosda, a poem of exquisite beauty, which, though the author and the date of its composition are unknown, must belong to a remote age, presents one of the best examples in the whole range of Gaelic poetry, of Iambic feet. The metre is Iambic Dimeter Acatalectic, *e.g.*:

O caraibh mi ri taobh nan allt,
A shiubhlas mall le ceumaibh ciuin,
Fo sgail a' bharraich leag mo cheann,
'S bi thus' a ghrian, ro-chairdeil rium.

Bishop Carswell's translation into Gaelic of John Knox's Liturgy was published in 1567, and was the first Gaelic book that was ever printed. In a brief Gaelic hymn or poem which he composed to the Gaelic book that he was sending forth among his Scottish and Irish fellow-Gaels, he shows an accurate familiarity with the peculiar features of Celtic verse.

Gluas romhad, a leabhrain bhig
Go hua ndiubhne rig ad reim.

There is here a correspondence between *bhig* and *rig* and an improper concord between *rig* and *reim*.

Gach seancha, gan seanchas, saobh.
Gach fear dano nar aomh breg,
Cumand eadar agus iad,
A leabhrain bhig biadh go heg.

Those verses furnish other examples of alliteration and correspondence in Carswell's hymn.

Lhuyd's *Archæologia Britannica*, was published in 1707. There are appended to the preface several Gaelic poems in praise of Lhuyd himself and of his great work on Celtic philology. These verses composed, as they were, by the Priest of Kildalton have several of the beauties and peculiarities of Celtic prosody.

"Tuigseach saoibhir do theagasg,
Soilleir tarbhach seimh do ghloir,
Lionmhur brioghmhur do shean fhocail,
Sgiamhach, taitnambhach, ciallach mor."

Regarding Cambrian or Welsh poetry, Zeuss asserts that the old poems of the Welsh are almost of the same structure as the old Irish poems. There is this difference, however, that the final consonant which is almost a monosyllable and is always full, is continued through several verses according to the pleasure of the Cambrian poet, and that even in separate parts of poems greater freedom obtains in the continuation of verses. The contraposition or antithesis of Hemistichs does not exist as is the case with Irish poetry. In his literature of the Cymry, (p. 475-476), Stephen writes "that the bards by fixing an artificial standard of versified perfection, concentrated attention upon the words and neglected the spirit of their poems. The merits of their poems are rather historical than poetical. Bardism was on the whole unfavourable to extraordinary merit and true poetic excellence. The regulations of the bards have acted as dead weights upon imagination, and the metaphors and images of many of the Kymric poets display either a want of taste or of originality." He further writes (p. 486), "I have another quarrel with the bards, for not only do they display affectation in the 'beginnings' of their lines but they also display it in their 'endings,' the effect of both practices being the depreciation of the poetry and filling up of the lines with unmeaning words." Price, than whom there is no better authority on all matters affecting Welsh poetry states (vol. 1, p. 209) "that the Welsh Bards rejoice in the Lyric, and when by chance they deviate but for a moment into the narrative, or Ballad, the style seems uncongenial with their spirit and they instantly quit it and return to their favorite strain." (p. 313) After 300 years of Roman Dominion upon the departure of that people,

Welsh poetry had not the slightest resemblance to that of Rome. The essentials of Roman metrical composition consist in quantity, those of the Welsh are Rhyme and Alliteration. The Latin classic prosody does not recognize the two last named requisites, nor does the Welsh know anything of classic quantity, neither is there any resemblance in the structure of the poems of the two races, further than what is the result of mere coincidence in all metrical compositions."

Alliteration, proper and improper concord, is of continual occurrence in Welsh poetry.

In Aneurin's famous poem Gododin, there is a variety of metres. "It is strictly a Lyric composition, a succession of comparatively unconnected strophes."

Ardyledawc cann cyman o fri
Twrf tan a tharan a rhyuerthi
Gwrhyt arderchawe marchawc mysgi,
Rudd fedel rhyfel a eidduni.

In these verses *cann* and *cyman* form an improper concord; *twrf*, *tan*, *tharan* also form an improper concord; *marchawc mysgi*, form a proper concord; *Rudd* and *rhyfel* form another improper concord. Alliteration is thus largely present in those verses, each of which ends in the same vowel, *i*.

A Triad, which is said to have been composed by Arthur, is faithful to the peculiarities of Celtic verse,

Sed ynt fy nhri chadfarchawg
Mael hir a Llyr Lluyddawg
A cholofon Cymru caradawg.

Two examples of proper concord occur here. Alliteration obtains between three of the last words in the last verse. The verses terminate in the same syllable; seven syllables frequently form one verse, a number which, whatever the explanation of its prevalence in Celtic poetry may be, is of common occurrence. Stephens mentions no less than twenty-four metres whieh were in use prior to the times of Meilir, one of the Welsh bards. He states that "the miserable affection of writing verses in all the metres has now been abandoned, and the poet is very properly allowed to use such of the metres as suits his taste."

Zeuss maintains, that if the older Cornish and Armorican poems were extant, they would doubtless exhibit a structure similar to that of the ancient Cambrian poems. Alliteration is wanting in the more modern Cornish and Armorican poems. The ancient Cornish drama containing

as it does the most important portion of Cornish literature that is extant, was published along with an English translation on the opposite page, by Edward Norris in 1859. The Beginning of the World, the Passion of our Lord Jesus Christ, and the Resurrection of our Lord Jesus Christ: Such are the names of the poems that constitute the Cornish Drama. The general division of it is into stanzas of six verses. Seven syllables commonly form one verse. There is an agreement in sound between the last syllable of the first and second verses, of the fourth and fifth verses, of the third and sixth verses, *e. g.*,

Mester genough yn gylwyr
Hagh arluth heuna yv guyr
Ytho mar kruge golhy,
Agos treys h' aga seghe
Golheus pup treys y gyle
Ahanough Kepar ha my.

In the introduction to his edition of Kelly's Manx Grammar, the late Mr. Gill inserted a Manx poem on which he bestowed great praise. The poem is written in Iambics and deserves the praise which the famous Manx scholar bestowed upon it.

As Cre ta gloyr, ach aaliad ennym vie,
Ennym! ta myr y ghall ta sheidey shaghey,
Shoh moylleyn pobble, my she moylley shen.

The famous Manx Song, Na Kirree fo Sniaghtey, or "The sheep under the snow," is written in Anapaests, *e. g.*

Lurg geurey dy niaghtey as arragh dy roi.
Va ny shenn chirree marroo's n' eagin veggey bio,
Oh! irree shiu guillyn as gowshin dyn clieu
Ta ny Kirree fo-sniaghtey shen va nyn draid reeve.

Vannin veg veen has all the raciness of Celtic verse.

O vannin veg veen
Tayns mean y cheayn
Aynjee ta lane eeasteyryn,
Tra ta 'n oarn cuirt,
As ny praasyn soit,
Goll roue dy cherragh ny baatyn.

The translation of Paradise Lost into Manx by Christian is in Iambics, *e. g.*, Pargis Caillit.

Yn Chiarn Iee skeayl magh reeriaght vooar da hene,
Liauyr fegooish Kione, as fegooish cagliagh lhean :
Niau jir mayd r'ee; cheer dy vaynrys vooar
Lane jeh dagh mie, jeh berchys, ooashley's gloyr.

Specimens of Pindaric impetuousness and originality of metre are to be found among the Celtic bards. Mary MacLeod or Mairi Nighean Alasdair ruaidh, furnishes many examples of such rapidity of thought and versification, *e. g.*,

Tigh mor macnasach meaghrach,
Nam macaibh 's nam maighdean,
Far 'm bu tartarach gleadhraich nan corn.

Duncan Ban MacIntyre is one of the most remarkable poets in the whole range of Celtic poetry. He could neither read nor write, and yet some of his poems are acknowledged to be the best of their kind in Celtic literature. "I shall be surprised," writes Professor Blackie, "to learn that there exists in any language, ancient or modern, a more original poem of the genus which we call venatorial than the Ben Dorain of Duncan Ban. What Landseer, in a sister art, has done for animals in general, that MacIntyre in this singular work has done for the deer and the roe." Blackie has translated Ben Dorain into forcible English verse. Principal Shairp has conferred a similar honour on Ben Dorain. Mackenzie in his introduction to *The Beauties of Gaelic Poetry*, (p. 51) thus writes, "In that admirable poem called Beinn Dorain, Duncan Ban MacIntyre has adapted the verse to the piobaireachd notes. Commencing with the *urlar* the ground-work or air, the second part is the *Siubhal* or quickening, arranged in a different measure, to which succeeds the *Crun-luath* swifter running music to which a suitable measure is likewise adapted. It is a curious effort, and his model seems to have been an older piece which accompanied *Moladh Mhairi* the praise of Mary, otherwise the MacLachlan's salute." Trochaics of a rapid character, Iambics of longer and shorter metres, alliteration, correspondence, etc., are to be found in Ben Dorain. *Moladh Moraig* is the name of a poem which Alexander MacDonald composed after the same model. I have in my possession a poem after the model of Ben Dorain, by the Rev. Dr. Blair, of Nova Scotia. The talented author designates his poem *Ruagadh nan sionnach*, or Hunting the foxes, and indicates a masterly command of the Gaelic language as well as a rare aptitude for framing tuneful cadences.

In his *Coire cheathaich*, Duncan Ban reproduces some of the peculiarities of Celtic verse, *e. g.*:

'Se Coire cheathaich nan aighean siubhlach
An Coire runach a's urar fonn,
Gu lurach, miad-fheurach, min-gheal sughar,
Gach lusan fluar bu chubhraidh leam.

In addition to concord, and to the recurrence of the same sounds, there is in those verses what Zeuss designates *Consonantia Contraposita*, or a correspondence between the last words of the Hemistichs. In his poem in praise of the Caledonian Society of Toronto, Evan MacColl furnishes beautiful examples of the same correspondence. The stanza which he has adopted is the same as that of *Coire-cheathaich*. He had added, however, one metre or two feet to each verse. The poem is throughout very able, and reflects great honour on the author. The correspondence between the Hemistichs in such verses as these is very beautiful, *e. g.*:

Cha-n eol domh toil-inntinn is mo na bhi' cluinntinn,
Piob mhor nan dos cnaimh-gheal is fonnmhoire fuaim;
Nuair theid i gu comhradh air faiche no'n seomar,
B'e'n Ceol thar gach Ceol leam a torman' nam chluais.

Though the Greek tragedians made frequent use of Anapaestic metre, no metre of that kind was employed by the Latin poets of the Augustan age.

Venient annis saecula seris
Quibus Oceanus vincula rerum
Laxet, et ingens pateat tellus
Tethysque novos delegat orbes
Nec sit terris ultima Thule.

These verses which occur in the Medea of Seneca and which have been regarded as prophetic of the discovery of America, furnish one of the best examples that can be adduced of the adaptation to Latin verse of the Anapaestic Dimeter Acatalectic. *Lochiel's Warning* by Campbell, and *The Destruction of Sennacherib* by Byron are excellent specimens of the application of the same metre to English verse. Having the same form of scansion by accent, as English verse and the Gaelic adaptations of Anapaestic verse have, it was beforehand to be expected that Gaelic Anapaests would not be and ought not to be inferior to English Anapaests in musical rhythm and faithfulness. The English and Gaelic version of his *Ealaidh Ghaoil* by the celebrated Gaelic scholar, Ewen MacLachlan, must command the admiration of every student of poetry: so faultless is the accuracy and so harmonious in both languages are the numbers of

the talented author. Mrs. Mary MacKellar is a poetess whose ability in the composing of Gaelic Anapaests is very remarkable, indeed, and whose mellifluous metres would do credit to a Greek tragedian. Several of Mrs. MacKellar's poems are written in Anapaests. She appears to fine advantage in praise of a meeting which was held in Edinburgh and of which the late Lord Colonsay—himself a Gael of the Gaels—was chairman, for the purpose of taking steps to establish a Chair of Celtic Literature in the University of that city. I shall give two stanzas merely of the poem in question.

O lionaibh dhomh corn 'us gu'n ol mi le fonn
Deoch-slainte nan uaislean sliochd uaibhreach nan sonn,
'S air tus cuiream failt air an t sar 'bh'air an ceann,
Am morair bho Cholonsa nan gorm ghleann 's nam beann.

A chanain mo mhathar, a chanain mo ghaoil,
Bidh tu fas ann an sgiamh gus'm bi crioch air an t-saogh'l,
'S ged bha thu gu tinn, gheabhar cinnteach dhuit leigh,
'S bidh tu luinneagach binn feadh gach linn' thig nar deigh."

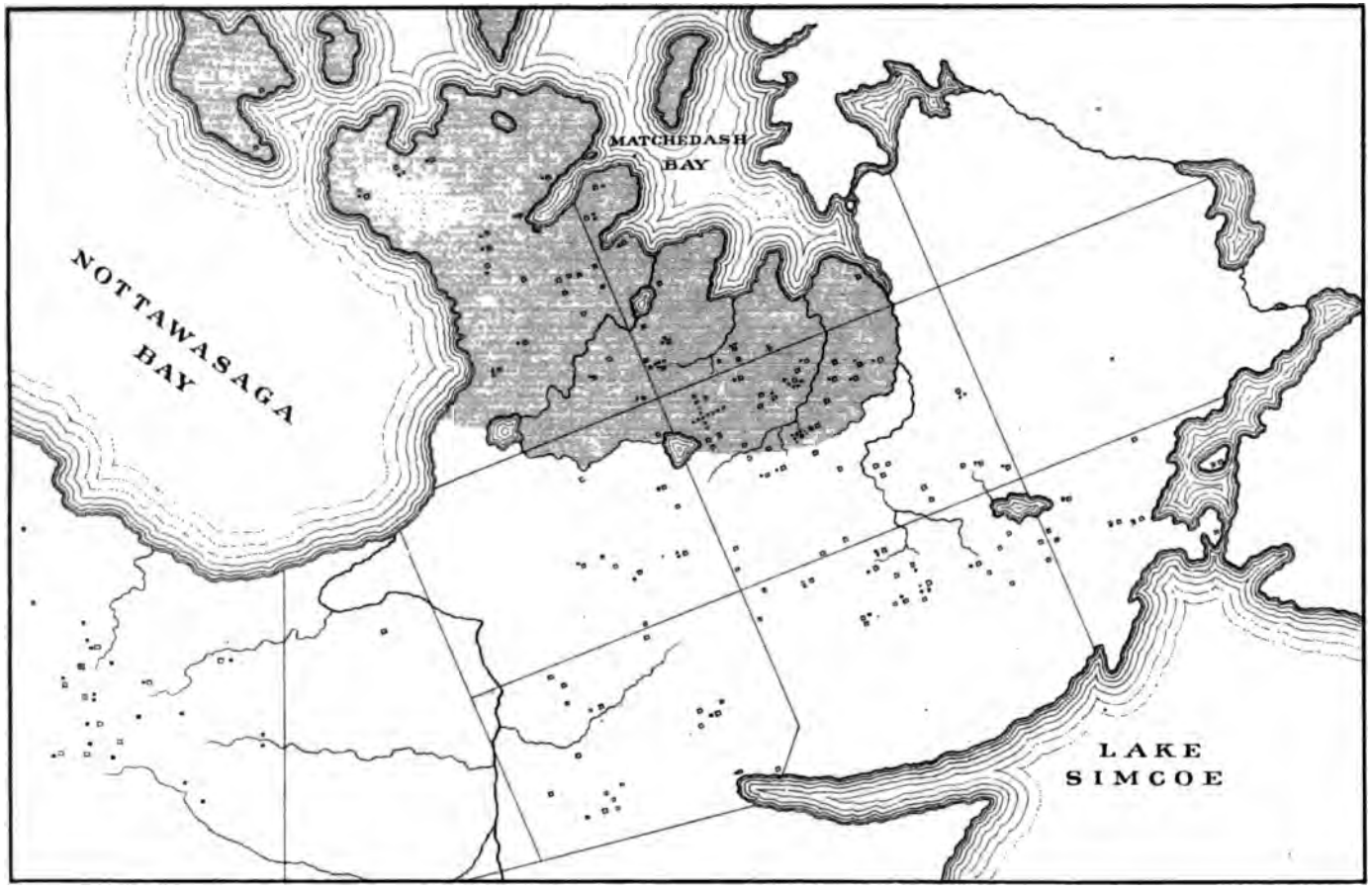
Mrs. MacKellar is equally at home in various forms of Gaelic verse, as her touching elegy in connection with the death of Prince Leopold clearly shows.

O buailidh mi 'n teud orbhuidh,
Fann bhuailidh mi 'n teud
'S mi' sileadh nan deur,
O'n chuala mi' n sgeul bronach.

Campbell of Ledag has composed Gaelic Trochaics and Iambics that are worthy of great praise. Neil MacLeod with an elegance of diction that would do honour to Tennyson with his pure Anglo-Saxon, has shown that he is a master of Gaelic verse, and that his native language can be fashioned by him into very musical combinations. The Irish poems that appear in the Gaelic Journal of Dublin, and in the Gaodhal of Brooklyn; the Gaelic poems that appear either in a permanent form or that have an ephemeral existence in newspapers and magazines, indicate that Celtic versification is keeping pace with the greater refinement and concinnity of modern poetry; and that the Celtic languages, if justice is done to them, have intrinsic strength and powers of adaptation which can gain for them, and ought to gain for them, as long and as glorious a future as is in store for even the most popular forms of German and English verse.

The domain of Celtic prosody is wide and fertile; and, although several tillers of the soil have ploughed many a deep and fruitful furrow in it, very much yet remains to be done. There is need of a Eugene O'Curry, who, intensely in love with the language and the poetry of his Celtic forefathers and brethren, will apply rare powers of mind and diligence to the thorough elucidation, for the benefit of his fellow Celts and of the literary world at large, of Celtic prosody, acting until his task has been happily completed, on the advice of one of the acknowledged masters of Latin verse;

"Nocturna versate manu, versate diurna."



MAP SHOWING THE POSITION OF THE HURONS WHEN THE IROQUOIS ATTACKS BEGAN.

NATIONAL CHARACTERISTICS AND MIGRATIONS OF THE HURONS AS INDICATED BY THEIR REMAINS IN NORTH SIMCOE.

By A. F. Hunter, M.A.

(Read 25th September, 1891).

The tract of land lying between Lake Simcoe and Georgian Bay is commonly known as the abode of the Huron Indians during the first half of the seventeenth century. But, to describe their location more definitely, it was on the high ground of the interior of this tract that they chiefly dwelt, as appears from their remains found at the present day; in the low parts of the wide valley of the Nottawasaga River, between them and the Tobacco Nation, very few traces of aboriginal occupation are found. It will be proper to lay special emphasis on the fact that the Hurons occupied high ground, because in this respect they contrast in a striking manner with the later Algonquins, who subsequently occupied the same district but preferred to haunt the waterways during the greater part of the year, and were naturally an aquatic people. Corresponding with this difference between the Hurons and Algonquins in the choice of locality, there was a similar contrast between their places of burial—so marked indeed that it is still impossible to confuse them. The Hurons selected places for burial purposes near their villages, almost always in dry and sandy soil, and remote from water. Of all their ossuaries brought to light in this century, only a few have been found where the soil is clay. But the Algonquins buried their dead near the river banks and lake shores, in places which they could easily reach in canoes.

The almost complete annihilation of the Hurons at their own villages in 1649, has been the most notable event in connection with the history of their race. It is possible to see at the present day the very spots where the massacres took place; these are indicated by large numbers of iron tomahawks strewing the ground, besides other marks of strife which are still visible. In Indian warfare, tomahawks were often hurled at the enemy—a practice that has been noted by Catlin [*Life Among the Indians*, chap. 2.] and other writers. Hence we now find patches of ground where they are found in abundance. On the accompanying map of North Simcoe there is defined the district in which these patches

occur, and which may therefore be regarded as the scene of the attacks by the Iroquois. The southerly limit of this afflicted territory is sharply defined. Two small lakes, joined by a stream which passes through a large swamp several miles in length as well as breadth, formed a natural protection to the Hurons on their exposed southwestern frontier; and thus, on the south eastern boundary only, were they exposed to the Iroquois invasions. Such was the position they occupied just before the final attacks were made upon them. The small district thus bounded contained all the villages in which the Jesuits labored, and included even Teanaustaye (St. Joseph) which Dr. Parkman, following Dr. Tachè's notes, places much farther to the south. There is a fringe of villages lying outside the southern and eastern boundaries of this district where but few tomahawks or signs of conflict are to be seen amongst the remains. Other features of the small district in question, besides the patches of tomahawks, are: the abundance of small ossuaries, indicating hasty burial; artificial holes in the ground, sometimes in rows and occasionally in crossrows; *caches* and isolated graves in great numbers. All these features are usually associated together, and indicate the village sites where massacres took place.

Compared with that portion of New York state once occupied by the Iroquois, the Huron territory contains fewer earthwork enclosures; Squier [*Antiquities of the State of New York*] records no less than 15 of these earthwork enclosures in* Jefferson Co., N. Y., alone. Compared also with the counties west of Lake Ontario and along the north shore of Lake Erie,—the district once occupied by the Neuters,—there is a similar contrast; Mr. Boyle, in his Annual Archaeological Reports of the Canadian Institute, has described several in that section of the country. In North Simcoe, however, whatever earthworks there are to be found are few and unimportant; only in a few cases does earth or *debris* appear to have been thrown up to any extent, except the ashpiles at the

* Since the above was written, a valuable article by Rev. W. M. Beauchamp, of Baldwinsville, N.Y., on the "Indian Occupation of New York," appeared in *Science* (Feb. 5, 1892). Mr. Beauchamp gave therein the numbers of earthworks, stockades, mounds and ossuaries of each county in New York State, recorded up to date, the earthworks in Jefferson Co. being placed at 33, and the ossuaries at 6.

A paper on "Early Indian Forts in New York" was read by the same writer at the Rochester meeting of the American Association in August, 1892. The paper is summarized in the Proceedings of that body as follows: "The form and construction of earthworks varied, and these generally preceded stockades, which were of four kinds: single, double, triple, and quadruple. The ditch was less defensive than incidental, and in stockades post-holes were not always used. Many examples of both modes of defence still remain, and Squier's estimate of their number was a fair one. According to the catalogue of the Bureau of Ethnology (Washington) defensive works belong mainly to the northern U.S., especially near the great lakes."

villages, and the pits made during the conflicts mentioned in the last paragraph.

There is a deficiency in regard to ossuaries in the Iroquois and Neuter territories in comparison with the Huron district. Squier, in his examination of the Iroquois country of Central New York in the volume already referred to, records but two in Jefferson County, and in Erie County but four or five. In three townships of North Simcoe—Tiny, Tay and Medonte—the three which include the afflicted district described above, more than sixty to our knowledge have been found. The location of sites upon high peninsular points of land, especially along the brows of lake terraces, sand ridges, or bluffs, seems to have been extensively followed by all three nations.

Since the year 1820, when Simcoe County first began to receive European settlers, discoveries of Huron ossuaries have been constantly taking place. In order to preserve a record of Huron occupation, we have catalogued 140 of these ossuaries; and from the scanty facilities enjoyed in the accomplishment of this task, it is clear that many more still remain unrecorded in our list. In these 140 ossuaries there was buried a population that from a careful estimate may be set down approximately as 25,000. The ossuary of average size, in the district, contains about 200 skeletons. From these figures it will be seen that the Jesuits' estimates of the Huron population were by no means exaggerated.

The proportion of ossuaries to village sites is much greater in the Huron district than seems to be the case in other parts of the province. It is not an unnatural inference from this fact, that those who occupied the other parts to the south and east, perished in North Simcoe and were buried there. In other words, it became the cemetery of Central Ontario at that period. It is not difficult to understand the cause of this, viz., the persecution of the Hurons by the Iroquois and the consequent retreat of the former toward the north.

Two or three additional facts may also be stated in support of the view just given. The most southerly towns of the Huron district were the largest, indicating a migration from the south. Champlain's map shows that in 1615 the Hurons extended southward to Lake Ontario as well as into the counties east of Lake Simcoe, and were not confined to North Simcoe alone as they became at a later date. This has been confirmed by the finding in South Simcoe, and in York, Ontario, Victoria, Peterborough, Durham and other counties, of many village sites and ossuaries of Huron origin. In a valuable paper by Mr. George E. Laidlaw, published in Mr. Boyle's Fourth Annual Report (1890), he suggests that

the aboriginal remains in Victoria County were the work of Hurons. Further evidence of their migration is yielded by the frequency of French relics in North Simcoe and their scarcity in the southern and eastern counties, indicating that the former was chiefly occupied by the Hurons after the year 1615 when the French first came amongst them. This has already been shown at some length in a paper by the writer entitled "French Relics from Village Sites of the Hurons," which was read before the Institute and published in the Third Archaeological Report (1889).

It is often stated that a "Feast of the Dead" was held in each of the five tribes of the Nation once in ten or twelve years. But from the large number of ossuaries which contain French relics, and which accordingly must have been interred between the years 1615 and 1649, it is evident that the ceremony took place much oftener.

There can scarcely be a possibility that an agricultural nation, such as the Hurons were, could have had its beginnings in this province, where the prevalence of forests would prevent any development in an agricultural direction, but where, on the contrary, the conditions would produce hunters and fisher-men like the Algonquins. It may be reasonably inferred that they originally came from a region where there were few trees to interfere with agricultural operations, such as the western plains; at any rate a northern or eastern origin of this people in the Laurentian rock region appears unlikely. Much investigation, however, is still required before these questions can be settled and the origin of the Huron race determined.

RUTHERFORD'S NARRATIVE—AN EPISODE IN THE PONTIAC WAR, 1763—AN UNPUBLISHED MANUSCRIPT BY LIEUT. RUTHERFORD OF THE "BLACK WATCH."

PRESENTED TO THE INSTITUTE BY THOMAS HODGINS, ESQ., M.A.

(*Read 5th March, 1892*)

Major Gladwin of the 80th Regiment, commanding officer of Detroit, being anxious to know whether the lakes and rivers between that place and Michellemakainac were navigable for vessels of a greater burthen than the small batteaux then made use of, ordered Captain Charles Robson of the 77th Regiment, who had the command of the king's ship upon Lake Erie, with a party of six soldiers and two sailors, with a large batteaux with the necessary implements, to sound the lakes. Sir Robert Davies, who had passed that winter at Detroit, having a curiosity to see further into the country, (which in fact was the motive which had induced him to come so far as Detroit,) accompanied Captain Robson, and both of these gentlemen inviting me to join them, I joyfully accepted the invitation, as it had then all the appearance of a pleasure jaunt. We promised ourselves excellent sport in shooting water fowl, with which that country abounds, not in the smallest degree dreading any interference from the savages around us, who but a little before in full council renewed their profession of friendship for the English, and received from them presents to a considerable amount. We accordingly set out on May 2nd, 1763. Captain Robson, myself, and the party were in the batteaux. Sir Robert Davies and a Pawnee or Indian slave were in a little wooden canoe, being better than a batteaux for going in shallow water after the game, and so easily navigated that he and his boy were sufficient to cross the lakes and go up the creeks among the Indian villages. We passed several native villages, but there appeared to be very few Indians in them. We supposed that they were out on a hunting party, but afterwards found they were on an expedition of a very different nature; being, in fact, collected at the place where we were afterwards attacked by them.

May 6th.—In the morning we arrived at Pinuree, where were some Canadians building a saw mill, for whom we brought (at the desire of a

French gentleman) a few barrels of flour, for which they returned us thanks, and told us with all the rhetoric they were masters of, that all the Indians around were in league to take up the hatchet against the English; that they knew we were coming that way, and were waiting six miles up the river to seize and destroy us; and that if we proceeded any further we should certainly be cut to pieces. They begged us with tears in their eyes for God's sake to return, and by reason of the winds and the strong current of the river we might gain the fort before they could perceive we had discovered their intentions. This was friendly advice given by people who showed in their countenances that they had our safety at heart; and had we followed their counsel many would have saved their lives on this occasion, and others avoided a long and dangerous captivity. Captain Robson partly doubted the truth of what the Canadians had told us, partly through mistaken confidence that they would not dare to attack us until cover of the night; and it being then noon, thought that he might go on six miles further and sound about the mouth of the river Huron; which done his work would be finished, and then return to the fort. He therefore ordered the rowers to ply their oars, and without seeming to suspect any danger, proceeded until we came within six miles of the above river, where there was a small Indian village, the very place the Canadians told us we would be attacked by the savages. Then it was, though alas! too late, that Captain Robson discovered the truth of the information we had got, for the whole bank of the river was covered with Indians, to the amount of three or four hundred men. Sir Robert Davies was at this time considerably before in his canoe, on shore, and smoked a pipe of friendship (as they called it) with some of their chiefs till we came up. He advised us to row on and pass him, and not to seem to suspect that they had a design upon us. Here I must observe that the river turned narrow, and was so rapid that we were obliged to keep the boat close to the shore, and even then the Indians could walk faster than we could row. To have attempted to return would have been inevitable destruction to us all. Besides that they had all their canoes ready to pursue us. This we were sensible of, so we kept rowing on and humoured them as much as possible. They crowded round us, men, women, and children, giving us the friendly appellation of brothers, told us they were glad to see us, and begged that we should come on shore and we would have whatever was good; the squaws or Indian women showing us maple sugar, fish, etc., to induce us to land. We did not, however, choose to accept of their invitation or presents. They asked for some bread and tobacco, which we gave them. This was only to take up our attention, for all the while they were filing off by degrees, till at last there was not an Indian to be seen. The squaws were collected so

closely on the bank of the river, endeavouring to divert our attention by ridiculous stories, that it was impossible to see what was going on behind, or what the men were about. The warriors, however, were then busy posting themselves behind a rising ground a little before, so that when we came opposite that place—the squaws as it had been preconcerted ran as fast as they could out of the way—the warriors commenced firing upon us at the distance of sixty yards. Captain Robson was immediately wounded on the left side, which showing me, he called to the men to sheer up, but alas! he had just spoken the words when another shot through his body killed him. I then took the helm and endeavoured to bring round the boat, but two of the soldiers being now killed, the remaining five could not navigate the boat, and as they had neither their arms ready nor loaded, they thought only of screening themselves as best they could from the enemy's fire; but it was all in vain, for the Indians, seeing Captain Robson our chief killed, and the confusion that prevailed, rushed upon us and easily boarded us, raising at the same time and in accordance to their custom on such occasions, the most dreadful cries and yellings, which they called the "Death Gralloo." They had changed their appearance from what it was when they called us brothers, having at that time their blanket and ornaments on, but now they were painted black and red, making a very frightful appearance. Every one of us was now seized by his future master, for by their custom whoever lays hold of a captive by the hair of his head, to him he belongs, and none may take him from him. I was laid hold of by one whose hideous aspect was enough to banish every hope of receiving quarter, but indeed before this I had given up any hope of being saved, and became in a manner resigned for the worst. They immediately scalped Captain Robson and the other two soldiers who were shot. My master (for such I was now to acknowledge him) dragged me out of the boat by the hair of the head into the water, which took me up to the neck, endangering my drowning; however, he brought me safe on shore, and with a rope adorned with trinkets (which they always carry about with them to bind their prisoners of war) bound me and delivered me over in charge of his squaw, returning himself to plunder the boat. All this time, Sir Robert Davies, as I was afterwards informed by his Indian boy, seeing the savages attack us, endeavoured to escape in his light canoe to the opposite side of the river, while the Indians called to him repeatedly to come on shore and deliver himself up, promising not to hurt a hair of his head. He paid no regard to their words, which so exasperated them that two of them levelled their pieces at him and brought him instantly down. His body fell over into the water, and having picked it up, they cut off the head and buried the trunk; the head they afterwards interred, after

having scalped it. My master returned with his share of the booty from the boat, which he laid upon my back, and marching through the village came to the hut where he lived. We had not been long there when a great many Indians came in, and got drunk upon spirit which they had plundered, and as I knew in their cups they often killed one another, I again considered myself in as much danger as ever. One of them dressed in Captain Robson's clothes came in very drunk, and seeing me lie in the corner with my hands tied, set up a shout, calling me an English dog, and made a stroke at me with his tomahawk, which must have killed me, had not another Indian more sober, and whom I afterwards found to be the best of them, seized his arm and prevented him, and then turned him out of the hut. My master's wife seeing the danger to which I was exposed, and knowing that he or some other Indian might return, made me lie down behind her, and covered me over with skins and furs; soon after the same Indian did return and demanded me of my master, saying that "No English dog should be left alive," upon which he was turned out a second time and well kicked. Not long after this a party of them came and determined to have me, and my master was obliged in order to save me, to tell them that I was carried to another hut, which satisfied them. The whole night they kept drinking what liquor we had brought with us, and making a most hideous yelling, dancing and singing, while they were feeding on poor Captain Robson's body. This shocking piece of barbarity was practised only by some of the Indian tribes to the northward. The Six Nations, who used their prisoners when alive much worse than those whose captives we were, yet never eat human flesh. They of course do not devour it for want of food, but as a religious ceremony, or rather from a superstitious idea that it makes them prosperous in war. They teach their children to be fond of it even from infancy. The next day my master's son brought some pieces of the body into the hut, and roasted them upon a stick, and endeavoured at the same time to prevail on me to eat it, after assuring me that Englishman's blood was very good to eat. My master desired of me to taste it, telling me that I was never going back to the English, so that I ought to conform to the manner of the Indians. I told him that I would obey him in every thing he ordered me, and even that if he insisted upon it; but that it was very disagreeable for me, and that was the only command I would feel any hesitation in performing, and begged that he would not absolutely insist upon it. Thus by assuming readiness to acquiesce, I avoided eating the remains of my friend, and I believe by showing a desire to please him I rather gained upon his affections. My hands were still bound behind my back, this day being the second of my captivity. Never having seen or heard any thing of the poor soldiers, I concluded

that they had shared the unhappy fate of their captain, which added the more to my uneasiness, fearing that I would not be more favourably dealt with. However, towards the evening of that day, I saw Sir Robert's Indian boy, who told me of some of the soldiers being alive. This boy having lived long with the English, in speaking their language made me think that he would desire to get free from the Indians who used him much worse than the English. I therefore thought I might confide in him, so laid myself open to him and told him of a scheme I had formed of our escape together, which was, that we should both get out of our respective beds at night when all were asleep, meet at a certain place agreed upon and then untie each other, and as he understood travelling in the woods, he would pilot us to Fort Detroit, which was not above eighty English miles distant, each of us bringing with him as much fish as would be necessary to subsist on during the journey. He agreed to this proposal, went off with an intention as I supposed of meeting me at the place appointed; however, towards the end of the evening, I was surprised to see my master come into the hut, looking very angrily at me, having a wooden post and an axe in his hand. Without saying a word he put one end of the post into the ground, and told me in an angry tone something I did not understand, with signs to me to lie down on my back; then taking my leg a little below the ankle, put it into the notch against which he tied another piece of string, so close that I could not move to turn myself on my side, but lay on my back with my hands bound, while my master, drawing the ends of the rope under his body lay down next me with his squaw on a bearskin. I passed the night like a criminal just before execution, with this difference, I had nothing to reproach myself, no offence committed against my God or the laws of my country; this treatment gave me good cause to suspect treachery on the part of the Indian boy, who I found afterwards had, in order to get his pardon, which he did, discovered my intentions of escape. Next morning my master loosed my leg, and by means of an Indian who spoke English, informed me that he had discovered my intention of escaping, and that had I done so or even attempted it, death would have been the inevitable consequence, showing me the situation of Fort Detroit, surrounded with four Indian nations, viz.: Chippewahs, (the nation I was with) Otterwahs, Ponteuatheimies, Wiandots, who so blockaded the place that nobody could come in or go out, and that in a few days there would not be an Englishman left in it alive; whereupon I found it absolutely necessary for my safety to affect to relish their savage manners, and put on an air of perfect contentment, which I had often heard was the way to gain the affections of the Indians, whereas showing discontented conduct irritates them and creates worse treatment, and even draws down

death itself on the captive who is so unfortunate as not to be able to accommodate himself to his situation. I therefore assured him I should no more think of leaving him, which so pleased him that he took me out to walk and pointed out to me the spot where Sir Robert Davies was buried and what remained of Captain Robson's body, showing me likewise how impossible it was for us to have escaped in our boats. He then led me to where the bodies of the poor soldiers lay who fell in the attack, and were become food for the dogs, which were devouring them; he then loosened my hand, and with the string bound up a heavy bundle of sticks which he placed upon my back, telling me that I was always to do that or whatever his wife desired me. When delivered of my burden he again tied up my hands, and fastened the rope to the rafters of the hut, but he did not put my feet in the stocks as the night before. Yet it was equally impossible for me to effect an escape, and indeed by this time I had given up all hopes of it, unless a more favourable opportunity occurred. Next morning my master went off in his canoe to join the rest of the warriors encamped at Detroit, leaving me to the care of his father, who seemed fond of me, and wished that I should become a savage as soon as possible. Soon after my master's departure he fairly stripped me of my clothes, and told me I should wear them no more, but dress like an Indian; he accordingly gave me a blanket, then shaved my head leaving only a small tuft of hair on the crown, and two small locks which he plated, with several silver brooches interwoven, making them hang over my face, which was painted a variety of colours; he likewise presented me with a tobacco pouch and pipes, telling me I should smoke, which I did, and afterwards became very fond of it. The hunting season being now passed, the Indians lived on fish, without bread, butter or salt. This did not agree with me. I became so very weak as to be rendered incapable of walking for seven or eight days, during which time my master's father informed me that I should not be eaten if I died. Ten days after this my master returned with the rest of his family, and after much talk of the success of their arms against the English, how many prisoners they had taken, etc., he looked at me, turning me round, apparently surprised at seeing me attired "en sauvage." He asked for my hair, which, the old man giving him, he carefully put by. Still my hands continued tied, and whenever I had occasion to go out, an Indian boy laid hold of the end of the rope, which he fastened to the rafters of the hut when I returned again. It was not long after this before my hands were at last unbound, my master often impressing upon me the impossibility of making my escape. I told him I had no design and feigned a satisfaction in their mode of life and a particular fondness for my new uniform, by which means I secured his good will. He thought he was

sure of me from my being so young, and that I would on that account sooner take to the novelty of their ways of life and more easily forget my country and my friends; certain it is that with this behaviour I fared better in many respects than those prisoners who appeared always sullen and subdued, some of whom indeed suffered death on that account. I now frequently saw two of the soldiers who were taken with myself, and the meetings at intervals were very satisfactory. It gives inexpressible pleasure to meet a countryman of one's own even in a civilized foreign land. Judge then how much more so when in a state of captivity with a nation of savages of a colour so different from our own. Happy was I to meet with those poor fellows whom but a short time before I would not have suffered to speak to me without the usual marks of respect from an inferior to a superior. Now there was no distinction, we being glad to find those people of the same colour with one another. We used often to compare notes of different treatment we met with from our masters. One of them told me he was obliged to eat of Captain Robson's body. We would form fifty different schemes for making our escape, but reject them all afterwards as perfectly impracticable. About the middle of May we were in great distress from want of provisions, owing to the indolence of the savages, who never stir out of their huts to fish or hunt until necessity drives them, which was our case at this time. During four days the wind continued so high that no fish could be caught, as they durst not venture upon the lakes in their little bark canoes. These are generally navigated by two men, or by a man and a boy, the former standing in the bow or fore part, where there is a pole fixed having a light fixed at the end of it which attracts the fish—it being on the darkest side they are most successful. The man in the bow marks the fish approaching, and directs the boy to steer the canoe so that he may best strike the fish with his harpoon. In this way I have seen as much as two men could carry of cat-fish, perch, and pike taken in two hours' time, independent of the satisfaction of procuring so necessary a part of their daily sustenance. It is a great amusement and really a pleasant scene to witness fifty of the lights moving on the smooth lake in every direction, while the silence is only disturbed by the varied cries of wild beasts from surrounding forests. I have observed before that the stormy weather had reduced us to the last extremity of want, having recourse to picking up acorns in the woods, and boiling them in ashes or water, changing them frequently to take off the bitter taste; and this was our food until the fifth day, when the winds abating we obtained plenty of fish. The Indians themselves are so accustomed to be reduced to this shift that they think nothing of it, and are always sure to make up their loss by future stuffing and sloth. While they have

victuals of any sort in their huts they do nothing but smoke, eat or sleep. It is on these occasions that the beaux and belles make their mutual conquests and dress in their best attire. They amuse themselves at times with a diversion something similar to the game of shinty which is in use among our boys, in which females play against the males, and often come off victors. My master used to deck me out in the richest manner, putting on me all the ornaments of the family, and taking me out to the plain, where he made me strut about to exhibit myself in the presence of the whole village, calling out to the people to look at the little white man. All this time I was made a show of without being allowed to join in the game. Towards the end of May we began to make preparations for our voyage to join the rest of the warriors encamped within a few miles of Detroit, for which purpose my master deemed it necessary to build a canoe, and which he and I accomplished in two days. It was of a sufficient size to carry all the family for many thousand miles. The evening before our departure I was surprised to see the master seize one of the dogs, of which animals he had several in the hut, and they were constantly poking their noses into our victuals, an operation easily performed as the floor was our only table, and neither chairs nor tables stood in the hut. This dog was killed, which I was not sorry for, and given over to the squaw, who scraped him as we do a hog in hot water. My master then invited all his neighbours, sending me round with a number of painted sticks, which were left with each one invited. Upon entering the hut where the feast is held, every one produces his stick and lays it upon the platter for the purpose. Each of the guests gets a double portion, eating one and carrying home the other in a dish which they bring with them to receive it. I sat in a corner of the hut, a silent spectator of my master's feast, being looked upon as a slave and unworthy to partake of so fine a repast. After killing or rather drowning another dog for the purpose of appeasing the evil spirit, as they gave me to understand, we set out next morning in our canoe, making short day voyages, always landing before sunset, putting up at that time our cabin and cooking our fish, which culinary office fell to my lot, as well as that of cutting firewood. The cabin or hut is soon made, it consists of about twenty trees put up in the shape of a sugar loaf, and covered all over with a sort of matting, excepting the hole at the top to let the smoke out. Every one carries his or her bed clothes upon his back, which are either the skins of a wild beast or a coarse blanket. All lie down promiscuously, men, women and children with their feet to the fire, which is in the centre. The second day of our voyage we came to an island where was an Indian burial ground. Here we halted round a particular grave, which my master afterwards told me was the grave of

his son. He made us all plant a few grains of corn, which we did, and re-embarking, proceeded on our voyage, which we ended in four days, arriving at a Frenchman's house in the neighbourhood of Detroit. This man being my master's ——, we took up our residence close to his house, rather than join the rest of the warriors, who were encamped five miles nearer the fort. We immediately set about building a large bark house, more convenient than those they carry about with them. The fireplace belonging to it was situated out of doors, where I was condemned to broil two hours every day, boiling their kettle, with a little fish or Indian corn. This new house occupied about four days in finishing, several parts of the work falling to my share, such as carrying home the wood and bark; here I must observe that I suffered inexpressible pain from not having any clothes on—not so much as a shirt to protect me from the scorching rays of the sun which burnt my back and shoulders so much that I was one mass of blisters, the palms of my hands being in the same state from the continued working of the oar. The next piece of fatigue I was put to was assisting my mistress in planting a large field of corn or maize or other vegetables. This being finished, my master carried me to the grand encampment about five miles from Detroit. Here I had the pleasure of seeing Captain Campbell and Lieutenant MacDougall of the 60th Regiment, who came out of the fort at the commencement of the blockade, with proposals of peace to the Indians. To this however, they would not listen; but on the contrary, detained those two officers prisoners at a Frenchman's house. Upon my observing to Captain Campbell that I thought we might escape, being so near as within sight of the fort, he advised me by no means to think of it, as he was well assured that if any one escaped, the Indians were determined to sacrifice those that remained. I frequently made visits to those gentlemen who were prisoners with the Ottawahs. Every day there were captures and scalps brought into the camp. The scalp is not, as commonly believed, the whole skin of the head, but only the uppermost part of the crown, and must have in it that swirl in the hair which every one has there, before it can be approved of as a just trophy of the warrior's achievements. They at this time brought in Ensign Pauli (60th Regiment) who commanded a small fort on Lake Erie. The Indians entered this fort as friends, and while some of them were smoking a pipe as a token of their pretended friendship, the rest were butchering their small garrison till not one was left alive. This gentleman made a very good Indian, being of a dark complexion. He was much liked by his master, who soon adopted him into his family, by which he was exempted from all drudgery. So great an assembly of Indians being gathered together in a French settlement, reduced the inhabitants to great distress; they had

their cattle, sheep and poultry killed, and when these failed we were almost being starved, having frequently nothing but a handful of corn for a day's sustenance, and that we parched in the ashes and ate it with a spoonful of bear's grease. I frequently used to beg for a morsel of bread at the French people's houses, from whose doors I was often turned away. In this distressed situation, my master prudently resolved to quit the camp, and moved accordingly back to the place where I was first taken prisoner. Here we had fish as formerly, and sometimes a little venison. On our return to the village, we halted at the burying place before mentioned, and while my mistress and I were busy erecting our hut, my master went out and killed a bear, which was eaten up heartily. After finishing our repast, I was ordered to put the kettle on the fire again, which circumstance surprised me a little, as we were in the habit of going to sleep immediately after eating. I was induced to ask the meaning, but was given to understand by looks and gestures that the mystery would be revealed on the following morning. My master then cut some of the choicest bits of the bear and put them in the kettle, which being hung over a slow fire, we went to rest. Next morning by day break we were called up, and in a formal and solemn manner walked up to the grave, where a small fire was kindled, round which we seated ourselves, and then my master arose and made a long speech, during which he often pointed to me and the grave alternately, while at every pause we all joined in a sort of chorus or amen, by way of acquiescence or approval of what he said. When he ended his oration, he divided the broth and meat among us, and after saying a few words over the grave, he put a piece of the fat of the bear into the fire, directing each of us to do the same. This I was informed was to appease the spirit of his son, who might be offended at my being adopted in his place. Such was his design, as he then told me, that I was as much his son, telling me at the same time to look upon the boys as my brothers; that my name should no longer be "Sagarast" or Englishman, but "Addick," which signifies a white elk; but notwithstanding this I was generally called by my master's name, which was "Perwash." My master, or rather my father now, took me out frequently with him hunting, an amusement of which I was very fond. Though this was not the season for killing deer, we were under the necessity of killing some for the family to subsist on when we returned to the camp near Detroit. As soon therefore, as we had cured a few carcases of venison, (which we did by smoking them without salt) we again set out to join the rest of the warriors. In crossing Lake St. Clair it happened to blow very hard, so that our little frigate was in danger of going to the bottom with Perwash and all his family. To appease the evil spirit he chewed some handfuls of tobacco and threw it

into the lake, at the same time pronouncing a long harangue. We contrived eventually to get safe to land, but whether owing to the tobacco I shall not pretend to say. The rain having drenched our clothes and blankets, we hung them upon trees till they dried. I may mention that the Indians likewise make use of the tobacco plant in thunder storms, by throwing a quantity of it into the fire, and while it is burning a squaw drums with a piece of iron on the bottom of a kettle, which they pretend prevents any mischief being done to the family by lightning. By the time our corn was grown up about a foot high, it became necessary to have it hoed and weeded, which was a severe task to my mother and me for six days. I flattered myself that my being adopted into the family would have exempted me from this kind of drudgery, but Perwash, having a particular regard for his wife, chose that I should still assist her on many occasions, and she being fond of her ease laid the most of it on my shoulders. She frequently made me pound or bruise corn in a large mortar, till there was scarcely any skin on my hands, and when I showed them to her she only laughed, and told me I would soon be better used to it, and that in time my hands would soon become hard like hers, which in truth were none of the softest. The men think it beneath them to do anything more than fish and hunt for the support of their families, and in this they take no more trouble than is absolutely necessary, for they frequently leave the game where killed, and send their squaws to bring it home, directing them where they would find it by breaking off branches and marking the trees for miles where they have hunted and left their game; this when their squaws have found, she brings home the choicest pieces and dresses them for her lord and master who generally sleeps till called to eat. When his repast is finished he regales himself with his pipe of tobacco, mixed with the leaves of the "Shumah shrub"; in the meantime the rest of the family are busy roasting fish or broiling steaks, each one for himself. The steaks are done upon the end of a stick, as we toast bread, and in my opinion that is the most delicious way of eating roast meat. Sometimes my "mother" roasted a large piece for the family, who never wait till it is thoroughly done, but as the outside becomes a little brown, everyone with his knife falls upon it and slices away as fast as it is roasted, by which means the pleasure of eating (their chief gratification) is prolonged. When soup is made, or rather when they boil their meat or fish, they hang up the kettle out of the reach of the dog, and every one drinks out of it when inclined. They use no salt and the absence of this at first made me think every thing tasteless; but hunger and habit prevailed over prejudice, and I soon came to eat as heartily as Perwash himself. About the 8th of June, Lieutenant MacDougall, with a Dutch trader escaped into the fort, which

caused them to look more strictly after us who were left, particularly Captain Campbell, who was shut up in a garret in a Frenchman's house. I frequently visited him, accompanied by Perwash. One morning he told me he felt ill and was prepossessed with the idea he would die very soon. I endeavoured to persuade him from indulging in such forebodings, which only tended to make him more melancholy; but to my grief and sorrow, the first thing I heard next morning was that he was killed by the savages. That morning Captain Hopkins of the Rangers had made a sortie from the fort, attacked a party of Indians and killed one of the chiefs of the nation to which I belong. The chief's friends were resolved to take the life of an Englishman of the rank of Captain. This they found convenient to accomplish by murdering poor Campbell who belonged to the Ottaway nation. The nation in their turn were enraged with the Chippewahs for slaying a prisoner who was their property, and of whom they were very fond. They therefore determined to have satisfaction for the outrage, and which they thought could not be more effectually obtained than by sacrificing a prisoner belonging to the Chippewahs of the rank equal to that of Captain Campbell. Accordingly to compensate this loss they pitched upon Ensign Pauli, but he being informed of the danger by a handsome squaw who fell in love with him, assisted by her he made his escape from the house of the Frenchman, whence with much difficulty he escaped to the fort, after being several times fired at by the sentries who took him to be a real Indian. The Ottawahs being disappointed in their design upon Pauli, determined next to take my life, being as they thought next rank to an officer and superior to any of the private prisoners among them. Perwash having heard that they were in search of me took me to a Frenchman's barn, where he covered me up with straw. In this situation I remained for the space of three hours, expecting every moment to feel the tomahawk in my skull, till a party of Indians with Perwash at their head came and conducted me away. Notwithstanding their reiterated assurance that I was not to suffer death, I could not help being alarmed and doubtful of my safety. They marched me in custody for four miles till we reached the grand encampment, which was in the midst of the French settlements. On the road lay a dead body mangled and scalped, which the dogs were eating. I was made to stop a considerable time while my guards viewed it with seeming satisfaction, telling me at the same time in exulting tones that there lay our grand chief Captain Campbell. I could not have indeed recognized in that mangled corpse the remains of my good friend whom they had murdered. It was a shocking spectacle—the head scalped, the nose, arms, ears and legs with other parts of the body cut off, yet however disagreeable to me, I was forced to behold it. They led me to a

great hall in a Frenchman's house, in the courtyard of which were about two hundred Indians of different nations. There was placed in the middle of the hall a small table and four chairs. A fifth chair was reserved for myself, though at that time I would gladly have dispensed with the honour. They then produced some English letters, and Pondiac the leading man of the four nations, told me by a French interpreter, that as I could speak French and read English, that they had pitched upon me to explain the meaning of these letters, which he ordered me to perform without concealing any part of them, threatening me with death if I did not translate the whole verbatim just as they were. Here one of the prisoners, a native of Virginia, who fond of an indolent life, had married and determined to stay among them, told me he could read English also, and would overlook the papers to detect any attempts at concealment, or misconstruction of the sense, adding that the consequences would be my being scalped on the spot. I accordingly set to work and read the letters in French, to a Frenchman who explained them to the chief. They were merely old letters which Captain Campbell had in his pocket when killed, and a few to him from his friends at Detroit during his imprisonment, which had been committed to the charge of a Frenchman, who instead of delivering them kept them. There were several French gentlemen in the room, who were as eager to read them as the Indians. What both French and English wanted to know in particular, was whether peace had been declared with France or not. It had been publicly declared at Detroit by Major Gladwin long before that time; but the Canadians could never bring themselves to believe that the "Grand Monarque" could ever cede their country to Great Britain, and still flattered themselves that if they could excite the Indians to maintain the war against us for a little while, that a reinforcement would arrive from France and they would drive the English out of the country. They had therefore always assured the Indians that Major Gladwin had declared there was peace only to prevent them from attacking him. The epistle contained, however, nothing that I thought could favour their wishes or designs, nevertheless they thought fit to construe them differently, or at least to doubt the truth and sincerity of Major Gladwin's proclamation of peace. When I had done with the interpretation, they all thanked me and appeared satisfied with my proceedings, permitting me to return home with Perwash who said he was happy in having got me off so well.

The most memorable circumstance which happened during my captivity was my being sold to Mr. Quilleim, with whom I was well acquainted before I was taken, and had since frequently visited with Perwash in order to procure a little bread and salt. In these

visits I proposed to Mr. Quilleim to purchase me from my master, whom I knew to be covetous and fond of riches, according to the Indian estimation of wealth, and which consists of being possessed with a profusion of trinkets, much wampum, beads, silver bracelets and gorgets. This gentleman, on account of Mr. Sterling with whom he was intimate, and whose daughter he afterwards married, was much my friend; he made several offers to Perwash for my purchase, first bringing him a horse and a cow, thinking that would prevail upon him, as he had often expressed a liking to the comforts that white people enjoyed, but he had a greater liking for me than to part with me at that price. He however, agreed to let me go for certain merchandise to the value of £40, upon condition that I was always to live with Mr. Quilleim, and not be allowed to go back to the English. This we both promised, although of course we only intended to keep it so long as it would not be attended with risk to the benefactor, for rather than he should be a sufferer I resolved to live with him, though at the hazard of being again seized by the savages. My "mother" and "brother" took an affectionate leave of me, and I went home laden with the things they had given me, and overjoyed with the change in my situation. I immediately cast away my greasy painted shirt which I had worn for two months without ever having had it washed. I scrubbed myself for two hours with soap and warm water to get the grease and paint off, then dressing myself in the costume of the Canadians, with a clean French shirt and long ruffles, and a mantle exactly like a bed gown, with a pair of new leggings, I began to feel pretty comfortable. The Frenchman with whom I was, being brother to the former commandant, and a great favourite with the Indians, (the latter had been rather civil to him in not killing all the stock, such as the cattle, poultry, etc.,) I got a good supper from him, genteelly served up, while a comfortable bed was provided for me in which I slept better than I had done for a long while before. I awoke next morning happy in the thought of being out of the hands of the savages, and once more returned to freedom, (as I imagined) never doubting that now I should have an opportunity of returning to my friends in the fort, or at least be quartered with so good a family till the war was over. With these pleasing reflections I consoled myself under the circumstances, but how fleeting are the hopes and joys of this life, and how uncertain are we weak mortals of what it may please the Almighty to make us suffer in this state of trial and probation! I was happy at this moment beyond expression, and in the next I was doomed to be miserable. Before sunset, as I was enjoying the company of the amicable Mademoiselle Quilleim, lamenting together the pitiable situation of many poor captives that were still in the hands of the Indians,

and were contriving methods for their deliverance, a party of armed Indians entered the house, all of them Ottawahs, and unknown to me, without saying a word to any one they seized me in a rude manner and hurried me down stairs. Then, indeed, my situation wore a very gloomy aspect. I was torn away from that excellent family without having time to say farewell, while on their part they were as much amazed and confounded as myself, nor durst they make any efforts on my behalf or any attempt to save me. The ladies of the family burst into tears, crossing themselves several times, and I believe fervently prayed for my deliverance. All that Mr. Quilleim could say or do was to encourage me to keep up my spirits and place my trust in "Le bon Dieu." As we pass along the Frenchman's houses the inhabitants all expressed a compassion for me, saying what a sad thing it was to behold so young a lad come to so cruel and untimely an end; while others advised me to keep up my spirits as there still might be hope. As for myself I own I was much shocked at first, but by degrees became more resigned, and began seriously to think my time was come at last, and that the many dangers and escapes that I had had were so many warnings to me to prepare for that change which we must all sooner or later undergo. They carried me to Pondiac's hut, the chief of the Ottawah tribe, and after being left there in a state of suspense for some hours, a Frenchman was procured to act as interpreter, who informed me on the part of the chief that the reason why I was taken from Monsieur Quilleim, was because several Dutch traders had got Frenchmen to buy or rather ransom prisoners like me, and that if he suffered that trade to be carried on, they would soon have no captives left. He therefore was resolved either to retain us all or have our scalps, in pursuance of which resolve he had ordered all those that had been so bought to be brought back again, and that he had intended to keep me himself. This speech relieved me in some degree from the disagreeable apprehension I was under, and gave me cause to consider that my last hour was not so near as I had expected, but I could not but wish that I was still with Perwash. However, I remained this night with Pondiac, but early next morning the Chippewahs, the nation to whom I formerly belonged, despatched a party to take me from the Ottawahs. Their chief, Pondiac, had however, taken a great fancy to me, owing I believe, to my youth, (I being then only seventeen years of age), as they seldom grow fond of elderly people, from a notion that they will never be reconciled to their Indian manners, and he therefore positively refused to give me up, the consequences of which refusal had well nigh been a war between the two nations. This was prevented by King Owasser, the chief of the Chippewah nation, having prevailed upon Pondiac to give me up. The latter, had after a good deal of altercation

come to this step, in order to avoid engaging in a war with a nation superior to his own, which, besides the possibility of destroying his own, would have infallibly ruined the common cause for which they had assembled. I was immediately carried off by King Owasser to his hut. He was very kind to me, and gave me plenty of food to eat, telling me at the same time that he had plenty of girls to do the work, and that I should never be desired to do anything, but should live as he and his sons did. This treatment gave me great satisfaction, and indeed the behaviour of the whole family vied with each other in showing me most countenance and favour, and when any disturbance or alarm took place in the camp, such as the young fellows out of savage wantonness, or in a drunken frolic killing any of the captives they could find, I was always concealed on these occasions until the danger was over. The old king became so very fond of me, that he offered to make me his son-in-law, when I should be disposed to marry and fancy any of his daughters, who were reckoned the handsomest in the camp, and had more wampum than any others. He was satisfied with my telling him that I felt myself highly honoured by the proposal, and although at that time not inclined to take a wife, I did not know how soon I might change my mind, and I should certainly be happy to take one of his family for a partner. Little did I suspect that the ease and tranquillity I then enjoyed should be of but transitory existence. I had not sojourned in my new situation for ten days, when Perwash, my former father, expressed a desire to have his son back again, saying that he and his wife had heartily regretted having sold me to the Frenchman, and were willing to return the merchandise exchanged for me, provided I was again restored to him, adding that it grieved their hearts to see me in the possession of another. Owasser, however great his desire to keep me in his family, knew that though he was chief of the nation, he had no power to keep another's property, nor did he choose to expose himself or his family to the revenge of Perwash, who would take the first opportunity of resenting the injury done to him. He was therefore obliged to give me up to my master, who with his whole house received me again with most expressive marks of joy and satisfaction, while that of Owasser seemed to regret my separation, the princesses themselves showing they were not indifferent. The number of prisoners now increased every day. Towards the end of July they had upwards of fifty, besides a number of scalps that were brought daily into the camp. They were every day killing some of their captives, even some of those that had been with them as long as I had. When I was in the hall of a Frenchman's house which was crowded with Indians, some of the young warriors brought in eight captives naked, into the hall, at sight of which I was surprised and terror

struck. I enquired of an Indian of the same nation as myself, who frequently had expressed a regard for me, whether or not I was to fall a sacrifice with these they were about to murder. At this question he was amazed at seeing me here, and without making any reply, hurried me through the crowd, and putting me into another room in the house charged me to lie close, make no noise, for otherwise I should be discovered and put to death, and locking the door he left me to ruminate on what had passed. I found in the same place two Dutch merchants in a similar position as myself, having been secreted by their different proprietors, who were desirous of saving them from the fury of their country men. During our confinement we heard the Indians making long harangues over their victims, telling them it was to make their nation prosper in the war against the English that they were to be killed. The poor captives were begging the Frenchmen who were looking on to intercede for them; one little boy in particular, (a drummer of the Rangers) about eleven or twelve years old, was crying bitterly, imploring their mercy, but alas! he knew not how vain it was to ask it of butchers whose hearts were steeled against every feeling of humanity. I ventured to creep to the side of the window where I saw them lead eight of the poor captives to the river side whom they massacred on the spot. Some of them they tomahawked, others they shot with their guns, while some were put to death by making the little boys shoot them with bows and arrows, in order to accustom them to cruelty and perfect them in the use of weapons. Thus they prolonged the pain of these unhappy men, and when one would fall the multitude would set up the most dreadful yells and shouts that can be imagined. When the objects of their barbarity were all dead they proceeded to scalp them, and some of the savages took the skin off their arms to make tobacco pouches of them, as they did with Captains Robson and Campbell. The first joints of the fingers were left dangling by way of tassels. They then threw the bodies into the river that they might flow down to the fort, that their countrymen might see specimens of what they should all undergo in a short time When this tragical scene was ended, the Indian who had hidden me came and set me at liberty, first leading me publicly through the crowd to convince me that there was no danger, and then conducted me to Perwash, who seemed very glad to see me safe, he having heard that the warriors were on the hunt after me for my destruction. The following cause was given for this last act of atrocity: an old squaw, the wife of a chief, dreamt that she saw ten Englishmen slain and scalped; this she recounted to the young warriors, who wished for nothing better than a pretext to make a frolic. She conjured them at the same time to make her dream good, otherwise she prophesied, they would not prosper in

war. This, with a good deal more enthusiastic stuff in her speech, at length excited their passions to such a pitch, that they flew about the camp like maniacs to collect their prisoners, in order to butcher them as above stated, and verify the dream of this imp of hell. However, they were in some measure disappointed, for those that had any concern for their captives, concealed them. The little drummer mentioned above was a favourite of an old squaw, who wanted much to save him, but notwithstanding her tears and most earnest entreaties, the young warriors tore him away from her, declaring upon such an occasion they would respect neither age nor sex. Almost every day exhibited fresh atrocities towards some of their prisoners, so that I lived in continual dread, expecting every day to be my last; I therefore resolved to attempt my escape at all hazards. There lived near to where we had our cabin a Frenchman named Boileau. This man had been civil to me on several occasions, and I thought might be willing to facilitate my escape by his assistance, I thereby succeeded in gaining him to my interest. As the French were permitted to enter the fort, I gave him a letter to my friend Mr. Sterling, who likewise promised him a recompense if he succeeded in my deliverance. Major Gladwin also, and several other officers assured him of their countenance. Upon his return, I found him quite ready to engage in my interest. I therefore redoubled my entreaties and promises in case of success. The next object to be considered was a plan for my departure in the most secret and unsuspicious manner. He formed many schemes, but rejected them all upon a more cool consideration of the matter. Our respective eagerness, (he to enjoy the promised reward and I to enjoy my liberty), made it difficult to determine upon the most practicable means of effecting it. However, we at last came to the following contrivance. On the evening appointed, the Frenchman was to embark in his canoe, and give out publicly he was going to fish as usual; instead of doing which he was to go about two miles down the river nearer to the Fort Detroit, and at a certain point of low land covered with bushes, he was then to put in with his canoe in the dusk of the evening, when the Indians would not perceive him and so conceal himself. I, on my part, was to make the best of my way to him in the night. This scheme we were to put into execution the evening after it was formed. This, however, was prevented for that and several succeeding nights, the Indians being alarmed by a report that the Chippewahs were to be attacked by our forces, which actually happened a few days after. Captain Dalzell, who had brought a reinforcement to Fort Detroit, issued from thence on the night of the 15th of August with a strong body of men under his command, with an intention of surprising the enemy's camp, but they had been warned by the French of his designs, for they

lay in ambush and attacked his party with great spirit, nay, they did on this occasion what savages were never known to do before, they threw themselves into houses, annoying the British troops very much from them and from behind fences. The action continued doubtful for some time; at last one troop were obliged to retire, which they did in good order to the Fort, leaving upon the field Captain Dalzell and about sixty private soldiers. Perwash knew nothing of the attack till the firing of the artillery and small arms aroused him from sleep, when he rose up in a great hurry, put on a powder horn and pouch, and tied my hands lest I should make an escape and kill the women and family. Then taking his gun he ran off as fast as he could to join the rest of the warriors and his party, who were about two miles off where he lived. In about a couple of hours afterwards he returned to us, overjoyed with the success of his party, giving a most pompous description of the fight, and giving out that a vast number of the English were killed, and allowed only six Indians to have fallen. He also told me that our great chief was killed, meaning Captain Dalzell. I was then unbound and sent to another hut for a large wooden mortar to put corn in to be pounded. The Indians to whom I was sent had also been at the engagement, and boasted of their feats prodigiously. They told me they had taken out the heart of our great chief, and would soon feed on it, showing me poor Dalzell's heart roasting at the fire, pieces of the fat of which the young men took and rubbed it, in my presence, on the mouth of a poor soldier in the 60th Regiment, whom they had taken prisoner. This and other barbarous usage practised upon the prisoners shocked me so much, that I went directly to Mr. Boileau under pretence of bringing some bread to our hut, and agreed to meet him that night at the place of rendezvous, repeating my promises of reward which I engaged still further to increase. When evening arrived I lay down as usual on my bear skin to repose, putting off all my raiments, wampum, silver bracelets, collar, etc., and about the middle of the night when I guessed all the family to be sound asleep, I crawled out of the hut on all fours. When outside I stood at the door for five minutes to hear if any one was stirring, but as everything was still I thought now was my time to set off, which I did as fast as my feet could carry me to the woods. I had no other clothing but my shirt, not daring even to put on a pair of mocassins to save my feet, for had the family happened to wake they would have instantly come to the door, and if they had found me dressed they would not have been at a loss to divine my intentions. I never in my life witnessed such a night of rain, thunder and lightning. It was so extremely dark and the woods so thick and full of briars and thorns, that I was greatly retarded in my progress. I could scarcely make more than a mile an hour. I therefore resolved

upon a new method, and quitting the woods for the river which was hard by, I waded with the water up to my chin, so that the Indians on the road could not see me. This plan would have succeeded had I had more time, but there were yet four miles to go before I could reach the rendezvous, and was in danger of being surprised in daylight. I therefore determined to take again to the woods, but was within an ace of being prevented, for just as I was going back to the bank I saw two Indians with guns, in close conference. They passed by on the road within twenty yards of me. Fortunately there was an old tree which had fallen into the river, behind which I immediately squatted, but could not completely conceal myself, so that they must have discovered me had they looked that way. If they had, I should never have got out of that place alive. This I knew and was in great apprehension, as several soldiers who had attempted to escape were caught and tomahawked on the spot. But these Indians, fortunately for me, were in close conversation, and being on a return from a feast were somewhat intoxicated. I saw them enter a little French house about one hundred yards distant. Then I immediately darted into the thicket making as little noise as possible, and to prevent the whiteness of my skin discovering me to the savages, I rubbed myself over with black moss and mire. Then pursuing my course in fear and hope, starting at every rustling of the trees, and mistaking the trunks for Indians, I at last arrived at the place appointed, and where I thought the Frenchman ought to have been waiting with his canoe, but he was not there. I ventured to call in a low voice, but nobody answered. I then began to exclaim against the perfidy of the Frenchman, who, in my desperate situation had, I thought, deceived me. Being much fatigued and exhausted I sat me down to rest, scarcely knowing what I did. My thoughts were occupied by the Frenchman's conduct, who, I endeavoured to persuade myself, would not be such a coward as to abandon me to my fate, when he knew I had to undergo the most perilous part of the enterprise. I considered too, that it was his profit also to carry the affair to a conclusion. At last, recollecting myself a little, and looking around me I discovered that my anxiety and fears had made me overlook that I was about a quarter of a mile farther up the river than the place appointed. This discovery gave me fresh vigour and spirit. I soon reached the right place, and to my inexpressible joy found the Frenchman asleep in his canoe. Having awoke him, we embarked and pushed out to the middle of the river, where we would have the advantage of the current to carry us down. We passed through the enemy's camp, making as little noise as possible with our paddles. We could plainly hear them talking, and observed a party dancing and singing round a fire. About an hour before day break we

arrived before Detroit, and got on board a ship lying opposite. Then it was that I was agitated in a manner that I never before experienced. It would be vain to give an idea of my feelings on this occasion. I went in the morning to the Fort, where my friends were overjoyed to see me again. To be sure I cut an odd figure among civilized society, the whole town turned out to see me. My appearance certainly was calculated to excite their pity as well as laughter. I had, as before remarked, nothing but a greasy painted shirt on, my face painted red, black and green, my hair cut all away, and my skin blacked all over with the moss I had put on. My legs were so lacerated with the briars and thorns and so affected with poisoned vines, that they were swollen as big as any in His Majesty's service. Besides this, to those who inspected me narrowly, my arms presented the appearance or impressions, one of a turkey's foot, the other of a flower in pink or purple dyes. I had thus been tattooed by the savages as a mark set upon me as belonging to their tribe, and such is the indelible effect upon the part punctured, that the impression will remain as fresh through life as on the first day of the operation. Monsieur Boileau, as soon as he had put me on board the ship went back again, fearing that if he did not return home he would be suspected of having aided me in my escape, and this was the last sight I had of him. Mr. Sterling, by my orders, gave me goods to the amount of £23, which with the £39 given by Monsieur Quilleim when he bought me, amounted to £62 10 shillings, Pennsylvanian currency. After I had been about ten days at the Fort, and had recovered from all my fatigues, it so happened that a vessel had to sail for the Niagara to bring a supply of provisions for the garrison. My friend Mr. Sterling, had obtained leave of Major Gladwin to have a considerable quantity of goods brought from that place to Detroit in his vessel, and having no proper person to whom he could safely confide their conveyance he therefore applied to me. I was sensible that the bringing up of these goods would be of great advantage to the company, it being likewise at a time when several articles were wanted here, and being anxious to do what office was in my power, for the benefit of a company with which my uncle was connected, I agreed to run the hazard of the undertaking, and accordingly embarked on board the ship. We had some shots fired at us from the Huron Indians going down the river, which we returned. In four days we reached Fort Schelope, near the Falls, and marched under a strong guard to Niagara, without experiencing any annoyance from the enemy. It was late before the sloop could be laden and ready to sail again. Some artillery and provisions with about eighteen officers and men of the 17th and 46th Regiments, constituted the chief part of what we had on board. We had only set sail one day, when the vessel sprang

a leak, and was half filled with water before it was observed. The pumps were all set agoing, but were of little use, so that after having thrown all the heavy artillery and some other things overboard, we found that the only way to save ourselves was to crowd sail to the land and run the vessel ashore; but it was the opinion of all that she would go to the bottom before this could be effected. While dread and consternation were depicted on the countenance of every one, I was surprised to find myself the least moved on the occasion, which must have been owing to my having been so much exposed and inured to danger some time previous. At a time when all were agitated in a less or greater degree, some stripping to swim, others cursing, swearing and upbraiding their companions for not working enough at the pumps, others praying, besides some who were drinking, I looked calmly on the scene, after I had become conscious I could be of no more use. When we were at the worst, and expecting every one to go down, one boat which was our last hope broke adrift; then indeed our situation was a dismal one. The cries and shrieks of a naval officer's lady with three children affected me much more than my own condition. It was really a piteous sight; the mother held two of her children in her arms, while the other little innocent was making a fruitless attempt to stop the water with her hands which was running into the cabin, and already flooded it to the depth of several inches. "She did this," she said, "to prevent the water from drowning her mamma." At last, to the inexpressible joy of all on board, the vessel struck upon a sand bank within fifty yards of the shore. The difficulty now was how to be conveyed to land, which it was desirable should be done with immediate haste, as we every moment dreaded being dashed to pieces by the violence of the surf of the lake. In this situation we should have been much at a loss, had not Captain Montresor of the Engineers, bravely undertaken to swim to shore, to endeavour to bring off the boat which had stranded there. The distance was considerable and the waves running high, and there was much danger of Indians being there on the watch; he, nevertheless, accomplished the bold adventure, and brought off the boat, by which means we all got safely on shore. Expecting the Indians would certainly come upon us, we fortified our position in the best way we could, with barrels of provisions, etc. The necessity of the measure was soon apparent, for we were soon attacked by a large body of them who had watched our movements, waiting doubtless till an opportunity offered of our being more off our guard, which, in fact we were at that moment. Several of us were walking along the beach, when we were of a sudden alarmed by the cries of the savages, which made every one take to his heels as fast as possible to gain the breastwork. I had very nearly fallen again into their hands on this

occasion, as I chanced to stray from my companions. There was one poor soldier of the 60th Regiment who happened to be nearest the enemy. They rushed upon him out of the woods, and the first who came up to him he instantly knocked down. The second savage struck him with his tomahawk which felled him to the ground; but neither that nor the scalping deprived him instantly of life, for as soon as the Indians left him, (dead as they thought) he got up, staggering to the foot of the hill where we had barricaded ourselves. The Indians still continued to pour their fire upon us, not a man durst venture forth to bring the poor soldier up the hill, who by this time had become insensible. He paid no attention to our calls, but wandered a little further on to where the Indians had gone. We afterwards found him a corpse under an old tree. For my own part I had much to do to regain the top of the hill, being hard pressed by several of the Indians, and in my flight scrambling through the bushes, I left both my shoes in their hands, a loss I did not much regret. As soon as we arrived at our breastwork they began to fire very heavily upon us, which we immediately returned. Our work being very open and inadequate, we had several men killed. The Indians left us near dawn. We were detained in this place, which we called "Lover's Leap," for twenty-four days, as we could not get a reinforcement of batteaux to carry us off to Niagara. It was here that I first entered upon duty as private soldier. After we had quitted this position, we marched over the carrying place at the Falls just three days after the Indians had defeated our troops in a *rencontre*. We saw about eighty dead bodies, unburied, scalped and sadly mangled. When at Niagara, I determined not to attempt fortune longer in the woods, and resolved to go to New York, where after residing some time with my uncle, I proceeded to join the 42nd Regiment, in which corps I had obtained an Ensigncy, at the time when they were preparing for an expedition against the Shawanese and Delaware Indians to the westward, under General Bouquet.

NOTE.

By Thomas Rutherford, of Farrington, Roxburghshire, Scotland.

The subject of the preceding was my father. He was born at Scarborough, in Yorkshire, 1746. His father having died at Barbadoes while he was yet an infant, he was sent to Scotland to the care of his grandfather, Sir John Rutherford, who had settled there, having amassed a considerable fortune by commerce, besides being proprietor of a large tract of land which still bears his name, "Rutherford County."

Soon after my father arrived in America he was sent by his uncle to Fort Detroit, in charge of military stores and supplies for the garrison, and having executed his commission, was about to return to New York, when he was prevailed upon to accompany an exploring party to the lakes, which set out on the 2nd of May, 1763. The account of that disastrous expedition was written by my father at Fort Detroit, immediately after his escape from the Indians, and addressed to his cousin, (Sir John Nisbet, of Dean) then at New York, who deeming the incidents of his captivity and escape sufficiently interesting to commemorate, had particularly desired to have a narrative of them in writing. After serving thirty years in the 42nd Regiment, (called the Black Watch) during which time he was engaged in both American wars, he quitted the army and retired to a small property, Mossburnford, in Roxburghshire. At a subsequent period he was appointed Major of the Dumfries Militia, under the command of the Earl of Dalkeith. He died at Jedburgh, on the 12th of January, 1830, in the eighty-fourth year of his age.

EARLY TRADERS AND TRADE-ROUTES IN ONTARIO AND THE WEST. 1760-1783.

By Capt. Ernest Cruikshank.

(*Read, 27th February, 1892*).

The reason why I have included the "West" within the scope of this paper is that from the conquest of Canada until about the year 1816 the whole region now forming the States of Iowa, Wisconsin, and Minnesota and for a considerable portion of that time, much of the present States of Ohio, Michigan, Indiana and Illinois still remained within the "sphere of British influence," long after it had actually ceased to be British territory. During the period named, practically the entire trade of this vast territory was conducted by English, Scotch, and Canadian merchants having Montreal as their base of supplies. From 1763 to 1783, all these northwestern territories, together with Ontario, were administered as a part of the "government" or province of Quebec.

These traders acted an important part during the American Revolution and the War of 1812 and it was largely due to their active loyalty and influence among the Indians that the western provinces were then preserved from becoming a part of the United States. British garrisons continued to occupy Detroit and Mackinac until 1796 and for twenty years afterwards the isolated settlers at Milwaukee, Green Bay, and Prairie du Chien still professed themselves British subjects and proudly kept the Union Jack flying over their trading stations. As late as 1818, I find a trader described in a legal instrument as "Amable Grignon of the parish of Green Bay, Upper Canada."

The Indian tribes of this region continued to be more or less under the control and superintendence of the Indian department of Upper Canada until about fifty years ago. Many of them made annual journeys from the banks of the Mississippi to Sandwich, Ont., to receive their presents. When the celebrated Black Hawk finally surrendered, he was found to have carefully treasured a British flag, and a medal of George the Third given to his tribe half a century before.

The conquest of Canada at once transferred the trade of the province and the vast interior country to the North and West from the hands of the French to those of English traders. Successive governors of Canada

had actively exerted themselves to confine the English colonists to a comparatively narrow strip of land along the Atlantic seaboard while they jealously retained the commerce of the great country behind, almost exclusively in their own hands. In this policy, they had been so far successful that in 1756 they held a chain of forts extending from Montreal to the foot of the Rockies. The posts of Presqu' Isle, Le Boeuf, Venango, Du Quesne, commanded the navigation of the Ohio. They had stations on the Chicago, St. Joseph's, Wisconsin, Wabash, and Illinois Rivers which quite monopolized the trade of the surrounding country. Thriving settlements of long-standing at Kaskaskia, St. Louis, New Orleans, and elsewhere on the Mississippi gave them full control of that mighty river. They had establishments at Prairie du Chien and Lake Pepin in Wisconsin. Pascoya on the upper Saskatchewan was 900 leagues beyond Mackinac and the journey usually occupied three months. Their most western post was still 100 leagues beyond Pascoya. La Verendrye, Le Gardeur de St. Pierre, De Niverville and other bold adventurers had explored the adjacent country. Determined efforts were made to wrest the trade of the Northern Indians from the Hudson's Bay Company. The northern shore of Lake Superior and the rivers falling into the Lake from that direction were thoroughly explored. An expedition fitted out at Mackinac ascended the Michipicoton or Pijicic River as far as they could go; hauling their boats overland to the head of Moose River they dropped swiftly down that stream and took the principal British factories on James Bay by surprise. They returned by the same route with their booty and when the French flag was finally lowered at Mackinac, two small cannon were found there which had been taken in this daring raid.

It is still possible to ascertain pretty closely the extent and value of their trade as it existed in 1754 just before the final struggle began. The Indian country had been mapped out into districts, and traders were strictly prohibited from passing the limits of the district for which they obtained licences. They were also forbidden to carry spirits except for their own use or to sell any to the Indians. Each trader was required to report at the post of his district before going out to trade and again on returning. The commandant of this post heard the complaints of the Indians and if they appeared well founded, promptly redressed their grievances.

As Sir Guy Carleton remarked, "They did not depend on the number of troops, but on the discretion of their officers, who learned the language of the natives, acted as magistrates, compelled the traders to deal equitably, and distributed the King's presents; by this conduct they

avoided giving jealousy, and gained the affections of an ignorant, credulous, and brave people whose ruling passions are independence, gratitude, revenge, with an unconquerable love of strong drink which must prove destructive to them and the fur-trade if permitted to be sent among them; thus managing them by address where force could not avail, they reconciled them to their troops and by degrees strengthened their posts at Niagara, Detroit, and Michilimackinac."

Ninety canoes were annually permitted to go to the southern posts. These were Niagara, Toronto, Frontenac, La Presentation, Detroit, Ouias, Miamis, Michilimackinac, La Baye, St. Joseph, Illinois, and their several dependencies. Twenty-eight canoes were despatched to the northern posts which were Temiscamingue, Chagouamigon, Nipigon, Gamanistigouia, Michipicoton, Mer du Ouest, Rivière des Kikipoux, Lake Huron, and Belle Rivière.

POST.			GARRISON.				
Niagara	5	Officers.	30	men.	10	Canoes.	
Toronto	1	"	7	"	5	"	
Frontenac	3	"	17	"	2	"	
Detroit and dependencies	4	"	28	"	17	"	
Michilimackinac and dependencies	2	"	15	"	25	"	
La Baye and dependencies	1	"	5	"	13	"	
St. Joseph	1	"			5	"	
Illinois					8	"	
Temiscamingue							
Chagouamigon	1	"			4	"	
Nipigon	1	"			5	"	
Gaministigouia, Michipicoton	1	"			9	"	
Mer du Ouest	1	"	6	"	9	"	
Rivière des Kikipoux					2	"	
Lake Huron					2	"	
Belle Rivière					2	"	

The average value of each canoe was estimated at 7000 *livres*. Toronto and Frontenac were called the King's Posts.* The trade there was conducted for the benefit of the Crown and the furs so obtained were sold by public auction in Montreal. Toronto in particular was founded with the express object of drawing trade away from the English post of Choueguen or Oswego. About two-thirds of the entire Indian trade, it will be

*In addition to those posts Kalm's map indicates the out-stations of Gandalskiagon apparently on the present site of Whitby, and Redcharle between Niagara and the mouth of the Genesee.

noticed, was carried on with the tribes of the Far West. For many years the determined hostility of the Six Nations had hindered the French from the free navigation of the great lakes, but they then had several small ships of war on each of the lower lakes and an unarmed schooner upon Lake Superior. All of these vessels were frequently employed in transporting goods between the principal posts.

Ample justice has been done to the great skill manifested by so many Frenchmen in the management of primitive people. "No other Europeans" says Merivale, "have ever displayed equal talents for conciliating savages or it must be added for approximating to their usages and modes of life." But truly remarkable as was the ascendancy acquired by Gautier, Langlade, La Corne and others, it is doubtful whether they ever possessed as great and permanent an influence among the Indians as Johnson, Butler, McKee, Elliott, or Dickson.

It is probable that few of the water-ways, *portages*, and paths used by the Indians remained unknown to the hardy and adventurous *Coureurs des Bois*. But their knowledge was jealously kept secret and much of it perished with them. Consequently after the conquest, land and water-routes formerly well known to the French, had to be re-discovered or at least re-explored by their successors. During the war too, many of the less important trading-stations had been abandoned or destroyed.

The old and favorite canoe-route from Montreal to Lake Huron by way of the Ottawa, Lake Nipissing, and French River although interrupted by no less than forty-two *portages* and *decharges* had never fallen into disuse, but four trading-houses upon the Ottawa alone had been recently abandoned and were already crumbling to ruin. One of these was 14 leagues above the Longue Sault, one three leagues higher at the mouth of Hare River, another at Isle des Allumettes, the fourth at the Rivière du Moine. A short portage connected a branch of the Ottawa with the Cataraqui and Lake Ontario.

Missionary, soldier, and trader had traversed in succession the route from the Bay of Quintè by way of Balsam Lake and Lake Simcoe to the once populous country of the Hurons. The more direct route from Toronto to Lake Simcoe was also frequently used in the latter days of the French occupation.

From Burlington Bay the Indians used a *portage* into the Upper Thames and another from the forks of that river into Lake Erie at Point aux Pins. Three well defined trails led from different points on the Grand River to Lake Ontario, and there was also a *portage* less than five miles in length from that stream into the Chippawa. The carrying-

place at Niagara Falls lay on the eastern bank of the river and was about nine miles long. Block-houses guarded the wharves at the landings, the lower being called Petite Marie; the upper, Little Niagara. Windlasses were used for hoisting heavy weights up the heights and also for assisting vessels to overcome the rapids at Fort Erie.

From Lake Erie the French made their way at an early date to Lake Chautauqua, thence down the Venango into the Ohio, but this route was soon abandoned for the shorter and easier one from Presqu' Isle (Erie) to French Creek. Here they made so good a road that heavy cannon were easily hauled over it in the days when they held Fort du Quesne. The forts they had built at Presqu' Isle, Venango, and Le Boeuf were taken and destroyed by the Indians during Pontiac's war. They were not rebuilt, the route became disused, and the road soon fell out of repair.

There were three other much frequented water-routes from Lake Erie to the Ohio. A *portage* of a single mile connected the headwaters of the Cuyahoga with the Muskingum; another four miles in length united the Sandusky with the Scioto. The carrying-place from the Miami of the Lakes to the Great Miami was nine miles long, and a branch of the former river interlocked with a branch of the Scioto. In the region watered by these rivers the fiercest struggle for trade had been waged and here those inevitable collisions occurred which precipitated the conquest. About three hundred English traders annually came over the mountains from Pennsylvania and Virginia. They usually ascended the Susquehanna, Juniata, or Potomac to the head of boat navigation and then made their way through the gaps of the hills to the nearest branch of the Ohio. Many of the Indians living in the vicinity were emigrants from the English colonies who had settled there with the permission of the Six Nations by whom they were treated as allies or "younger brothers." From the first they were inclined to be friendly to the English and regarded the French with suspicion. One English factory was established far up the Muskingum, another at Shannoah (Shawnee-town) near the confluence of the Scioto with the Ohio, but their principal mart and place of trade was at Pickiwillany (Piqua) on the upper waters of the Great Miami. From these posts, individual traders driving pack-horses before them made their way to the different Indian settlements. As early as 1749, De Bienville reported that every village on the Ohio and its tributaries had one or more English traders in it and that each of these had men employed in transporting their furs. Raymond, the Commandant of the French post on the Miami of the Lakes, at the same time described the feeling of the Indians as decidedly hostile to his countrymen.

The Six Nations claimed the sovereignty over the country on the

south side of Lake Erie as far west as the Sandusky River. They held it solely as a hunting ground, making no attempt at a permanent settlement. They also claimed the lands on either side of the Ohio from its source to the mouth of the Wabash. The Delawares, reduced to less than 500 warriors had taken up their residence on the Muskingum, and the Shawanese, another allied tribe, numbering 300 fighting men, were seated on the Scioto. Neither of these tribes raised much grain. They maintained themselves almost entirely by hunting in which they were very expert. The Wyandots (frequently called Hurons) occupied a very fertile tract of land on the Sandusky River. The number of adult males was variously estimated at from two to six hundred. Their villages were composed of regularly framed houses neatly covered with bark. They were considered the richest and most industrious Indians on the continent. Mr. McKee told Governor Simcoe that when he first became acquainted with these people (about 1750) they would frequently change their dresses eight or ten times in the course of an evening, when holding one of their grand dances, and that each dress was so loaded with ornaments as to be valued at £40 or £50. They bred many horses, black cattle, and hogs and grew great quantities of grain not only for their own use but for the supply of the neighboring tribes that preferred to employ themselves entirely in hunting.

In 1752, Charles de Langlade at the head of a band of Chippewas destroyed the English factory at Pickiwillany and the remaining traders were soon chased from the Ohio valley. The neighboring Indians then passed for a few years under French influence, but never seem to have become actively hostile to the English. When the war was over, the trading-posts were not re-established, as the Indians could be easily supplied from Pittsburg or Detroit.

This province as far north as the borders of Lake Michigan was frequented only by roving bands of Missassaugas who seldom remained long in one place. At the date of the conquest, their principal village seems to have been near the present site of Toronto.

A remnant of the Hurons, Christianized and superintended by a French missionary, was settled opposite the village of Detroit.

The French inhabitants of Detroit already numbered about 2500. The settlement extended seven or eight miles on both sides of the river, and was in a flourishing condition. The settlers grew a considerable quantity of grain and bred many cattle but they devoted their attention chiefly to the fur-trade which was great and lucrative. Tribes of the Ottawa Confederacy numbering about 900 warriors had their villages in the immediate vicinity.

From Detroit the favorite route to the Illinois and the Mississippi was by the Miami of the Lakes and its tributary the Au Glaize, from which there was a portage of twelve miles to the Wabash. The distance to Fort Miamis on the Au Glaize was 216 miles. A few French and half-breed families occupied a deserted fort, and the Miami village opposite could turn out 250 fighting men. Thence to Ouias or Ouiatanon, hard by a populous Kickapoo village with the principal town of the Ouias (Weas) directly opposite, was 183 miles of rather difficult navigation. Vincennes, 240 miles further down the Wabash, had long been an important station. A trading-house had been established there in the same year that Penn had founded Philadelphia. The permanent population of the French village did not exceed four hundred persons, but the Indians for a great distance around constantly resorted to this place for their supplies and trade was brisk. The distance by land across the prairie to the Illinois was estimated at 240 miles.

Much shorter but less frequented was the land-route from Detroit to Fort St. Joseph on the river of the same name, situated close beside a village of 200 Ottawa warriors and another of 150 Pottawatomies. From this place there was a portage of four miles to the Kankakee, a branch of the Illinois. The distance by water to the Mississippi was 541 miles. There was a second portage from the St. Joseph to the Wabash. The Chicago river was connected in a similar manner with another branch of the Illinois. All of these routes were much used by the Mackinac traders.

The French settlements on the Illinois were flourishing and populous. As early as 1750, Père Vivier had estimated their population at 1100 whites, 300 negro and 60 Indian slaves. At the date of the conquest it was believed to have increased to 2050 whites and 900 negroes, but many soon afterwards elected to follow the French flag across the Mississippi rather than submit to English rule. In 1765 the geographer Hutchins stated that Kaskaskia had a population of 500 whites and 400 or 500 negroes; Prairie du Rocher, 100 whites and 80 negroes; Cahokia, 300 whites and 80 negroes.

The station of Michilimackinac, situated on the western shore of the straits of the same name, was the distributing point for the trade of the farther west and northwest. It had been shrewdly built on the very boundary line between the territories of the Ottawa and Chippewa Indians, so that when these two nations came to trade, each could encamp on its own lands within a stone's throw of the stockade which stood so near the water's edge that the waves frequently dashed against the palisades. The Jesuit mission of St. Ignace and about thirty houses

stood within. Twenty miles to westward lay the Ottawa village of L'Arbre Croche having a population of fifteen hundred Christian Indians principally engaged in agriculture. In fact the traders of the post were wholly dependent upon them for provisions both for their expeditions into the fur-country to the west and north and when returning to Montreal.

A number of French families had already taken up their permanent residence on Green Bay near the mouth of the Fox river where they cultivated small farms and gained a comfortable living by selling their surplus products to passing traders. The Fox and Wisconsin rivers afforded an easy and tolerably direct passage to the Mississippi.

The principal village of the Winnebagoes or Puants stood on an Island in the lake to which they bequeathed their name. The capital of the Sacs on the Wisconsin river was described by Carver as the largest and best-built Indian town he had ever seen in the course of his extensive experience. It consisted of about ninety houses, each of them large enough to shelter several families, built of hewn plank neatly jointed, and covered so securely as to be proof against the heaviest rains. The streets were regular and spacious. The inhabitants tilled their gardens energetically and grew such quantities of corn and vegetables that this was considered the best market to purchase provisions of any within several hundred miles. The male population of the tribes between Green Bay and the Mississippi was not believed to exceed 1200, divided in the following proportions.—Menomonees, 110; Folles-Avoines, 100; Winnebagoes or Puants, 300; Sacs, 300; Foxes, 320.

An Indian village of almost three hundred houses occupied the site of Prairie du Chien and a considerable number of French traders made it their head-quarters. The neighboring tribes and even those living on the most remote branches of the Mississippi annually assembled there about the end of May with the furs they had obtained during the winter. A general council of the chiefs was then held to determine whether they should sell their peltry to the traders who came there to purchase or take them to the French posts in Louisiana.

All of the smaller trading-stations to the north and west of Mackinac had been abandoned during the war except one occupied by J. B. Cadotte at Sault Ste. Marie.

The Ottawas and Sioux and the Indians of Wisconsin generally, remained firmly attached to the French interests and it was from these hardy and warlike tribes that they obtained their most efficient auxiliaries. Picked bands of these Indians had defeated Braddock on the

Monongahela and participated in the French triumphs at Oswego and Lake Champlain.

The number of Indians living to the north of Lake Superior and Huron was vaguely estimated at 12,000 fighting men, chiefly Saulteaux and other clans of the great Ottawa Confederacy. Those about Lake Nipissing, frequently termed the Lake Indians, were conjectured in the same loose way to amount to half that number, but very little was known about them as they had scarcely any commerce with the whites. They had no fire-arms and seemed to have no intercourse of any kind with other tribes. Rogers said that they appeared "to live as independent as if they had a whole world to themselves."

Traders from the English colonies hastened to occupy the new channels of trade suddenly opened to them by the fortunes of war. They followed hard on the heels of the victorious armies and sometimes even preceded them.

When on his way to Detroit in 1761, Sir William Johnson found that a storehouse had already been built at the upper landing on the Niagara by Rutherford, Duncan & Co, who were preparing to monopolize the carrying-place around the Falls under authority of a permit from General Amherst. They had discovered a large quantity of hand-sawn plank left by the French in the Chippawa Creek and were using it to build a small vessel for the purpose of exploring the unknown shores of the upper lakes.

Other merchants established themselves at Oswego where for a few years they carried on a greater Indian trade than at any other place on the continent.

One of the first English merchants to make his way to the Lake Superior country was Alexander Henry who published an account of his early travels in 1809. In 1760, he accompanied General Amherst's army in its advance upon Montreal, taking with him three boats loaded with merchandise. By singular ill-luck or mismanagement all his boats were swamped in attempting to run the rapids at the Cedars and he lost his entire stock. Undismayed by this disaster Henry immediately hurried back to Albany and secured a fresh supply. This was quickly sold at Fort Levi. Tempted by dazzling tales of the ease and rapidity with which fortunes were made at Mackinac, the great fur-market of the west, he resolved to go there next year. Even then he was not destined to be first in the field, for General Gage had already granted a passport for that place to Henry Bostwick, and it was with difficulty that he was persuaded to issue another as the French posts west of Detroit had not yet been

surrendered and the Indians were reported to be very hostile to the English. Henry's persistence finally triumphed, and early in the spring of 1761 he set out on his journey, with several large canoes heavily loaded. Following the Ottawa route he reached Mackinac several days in advance of a body of soldiers sent from Detroit to take possession of the fort. He found Mr. Bostwick already there and their lives seem to have been in some danger until the troops arrived. Detachments were immediately sent to occupy St. Joseph's, Green Bay, and Sault Ste. Marie, but as the public buildings at the latter place were accidently burnt soon afterwards, its garrison was withdrawn.

When Mackinac was taken by the Indians, Henry, Bostwick, Ezekiel Solomon, (another English merchant) and about three hundred French Canadian *Voyageurs* and others were made prisoners. A Mr. Tracy was the only English trader who was killed on that occasion. The small garrisons at St. Joseph's and Green Bay were next compelled to surrender. In this extremity, Cadotte of Sault Ste. Marie proved himself a true friend to the English. He dissuaded the Chippewas of Lake Superior from joining Pontiac and used his influence to obtain the release of the prisoners. Henry was sent by way of Lake Simcoe and Toronto to Niagara where he arrived in time to accompany Bradstreet's avenging army to Detroit, in command of a small party of friendly Indians.

In 1765, a regulation was adopted prohibiting all white men from trading to westward of Detroit without a license and Henry's perseverance was rewarded by the monopoly of the trade of Lake Superior. He seems to have had no ready money, but he promptly bought four freighted canoes at twelve month's credit for 10,000 pounds of beaver. This fur was then worth 2s. 6d. a pound. At Mackinac the value of every commodity was reckoned in pounds of beaver. Manufactured goods of every kind brought fabulous prices. A stroud blanket was valued at ten beaver skins; a trade-musket at twenty; a pound of powder or a two-pound axe at two; a knife or a pound of ball at one. For a shirt, Henry had shortly before paid ten pounds of beaver and fifteen for a pair of leggings. Even when a man went to the garrison-canteen, he took with him a marten skin (worth 1s. 6d.) to pay for his drink.

Henry took Cadotte into partnership and apparently put the trade of Sault Ste. Marie and the north shore into his hands. He next engaged twelve boatmen at one hundred pounds of beaver each for the season, and bought for their provision fifty bushels of Indian corn for ten pounds of beaver a bushel and the customary allowance of tallow at a dollar a pound. Upon arriving at Chagouamigon (or Chequamegon) Bay, where the French had formerly a trading post upon an island, he found the

Indians destitute and almost naked, and was obliged to advance them at once goods to the value of 3000 beaver-skins. The result of the winter's trade was 150 packs of beaver weighing a hundred pounds each and twenty-five packs of otter and marten.

In his second venture, he advanced to each male Indian, goods valued at one hundred pounds of beaver and to each woman, thirty pounds worth. As a proof of the remarkable honesty of these people, he relates that although he had advanced to them at this time goods to the value of two thousand beaver-skins, not more than thirty skins were unpaid in the spring, and that this loss was due to the death of an Indian whose family brought in all the furs he possessed and offered to pay for the remainder.

Upon again returning to Mackinac, he made the acquaintance of Mr. Alexander Baxter who had come from England to examine the deposits of copper ore on Lake Superior and he threw himself with his accustomed energy into this mining project. A company was soon formed, composed of the Duke of Gloucester, Hon. Charles Townshend, Sir Samuel Tutchet, Mr. Baxter, the Russian consul in London, and Mr. Cruikshank in England and Sir Wm. Johnson and Mr. Alex. Baxter in America. In 1770, Mr. Baxter returned from England with the necessary authority to begin operations. Bostwick and Henry were next taken into partnership, probably to make use of their local knowledge and influence. During the winter they built a barge and a sloop of forty tons at Point aux Pins near Sault Ste. Marie, and in May, 1771, they sailed with a party of miners for Ontonagan where they built a house and opened a mine. The miners were left there during the winter and in the following spring a boat was sent to them with a supply of provisions. On the 20th of June, it returned with the entire party. The mine had suddenly caved in and they had failed to find silver ore in paying quantities. In August of that year they began working a vein of copper on the north shore and during the season of 1773 penetrated about thirty feet into the rock. The vein then rapidly diminished in size and was abandoned. This failure combined with the high price of labor and provisions and the difficulty of obtaining mining supplies thoroughly disheartened the English shareholders and they declined to proceed.*

During these years Henry had continued to trade with the Indians of Lake Superior but he soon determined to seek the new and promising field of trade in Canadian Northwest.

*General Gage remarked that "their want of success was not so much owing to the mismanagement of their agents as to want of foresight in providing the necessities requisite for such an undertaking the want of which at that immense distance must have overturned their scheme at once."—*Letter to Captain Vattas, 26th December, 1773.*

A trader whose name I have not ascertained had sent several canoes as far as Rainy Lake in 1765. The Indians there having been without supplies for several years, detained and plundered them. He repeated his attempt the next year with the same result. With astonishing perseverance he fitted out a third expedition in 1766 and was rewarded with success. Leaving part of his goods at Rainy Lake to be traded out among the Indians there, he was permitted to proceed with the remainder beyond Lake Winnipeg. Other traders soon followed in his footsteps. In 1769, the brothers Frobisher formed a partnership with Todd and McGill of Montreal for the purpose of prosecuting this trade on a large scale. The Indians of Rainy Lake were not yet entirely conciliated and plundered their canoes, but before they were informed of this disaster, their supply of goods for the next year was at the Grand Portage and they were in a manner forced to proceed. Their second venture was successful and they reached Lake Winnipeg in 1770. The partnership was then enlarged and to borrow their own words, "having men of conduct and abilities to conduct it in the interior country, the Indians were abundantly supplied and at the same time well treated, new posts were discovered as early as the year 1774, which to the French were totally unknown, and had we not been interrupted by new adventurers the public in the course of a few years would have been well acquainted with the value and extent of that country."

Cadotte and Henry may probably be classed among these new adventurers. Their first expedition to the northwest of Lake Superior was undertaken in 1775. When crossing Lake Winnipeg they fell in with Peter Pond, Joseph and Thomas Frobisher, and Mr Paterson of Montreal, all bound for the mouth of the Saskatchewan. The united fleet numbered thirty canoes manned by one hundred and thirty men. At Fort Cumberland they separated, Pond going to Fort Dauphin, Cadotte to Fort des Prairies with four canoes, and the Frobishers and Henry to the Churchill River with ten others. Four different interests were then struggling for the trade of the Saskatchewan Valley but they soon combined to keep up prices. A trade-musket was valued at twenty beaver skins; a stroud blanket at ten; a white blanket at eight; a one pound axe at three; half a pint of powder or ten bullets at one. Their greatest profit was however made from the sale of knives, beads, flints, awls, and other small articles. Henry charged his rivals, the factors of the Hudson Bay Company, with practising many gross impositions upon the natives, such as the sale of prints for charms and sugar and spice as medicines.

Trade was remarkably brisk and lucrative. During the winter of

1775-6 from twenty to thirty Indians daily arrived at Henry's station on the Churchill loaded with the finest quality of furs, and in the following June, he purchased 12,000 beaver skins in three days.

Major Robert Rogers, the celebrated partisan, was one of the first English colonists to explore the country around the great lakes, and while in command at Mackinac he appears to have dabbled in the enticing fur-trade. As early as 1765, he published a small book entitled "A concise account of North America."

Stating his qualifications as an authority on the subject in the preface, he said: "This River (the St. Lawrence) I have traced and am pretty well acquainted with the country adjacent to it as far up as Lake Superior, and with the country from the Green Bay to the Mississippi, and from thence down to the mouth of the Mississippi at the Gulf of Mexico. I have also travelled the country adjacent to the Ohio and its principal branches and that between the Ohio and Lakes Erie and Michigan and the countries of the southern Indians."

Jonathan Carver, a New Englander, wrote an interesting narrative of his travels in the West during the year 1766-8. Furnished by Major Rogers with a letter of credit on some English and Canadian traders who were going to the Mississippi he left Mackinac on the 3rd of September, 1766, and reached La Baye on the 18th. The fort at that place as well as the one at St. Joseph's had been abandoned since Pontiac's war and was fast falling to ruin. He stayed there two days but arrived at the Winnebago town on the 25th. Eight days paddling brought him to the carrying-place, leading to the Wisconsin from whence he gained the Mississippi by easy stages. At Lake Pepin, he noticed the ruins of St. Pierre's deserted station. He ascended the Mississippi to the mouth of the St. Pierre and went up the latter river about two hundred miles. French traders from Louisiana had been among the Indians in this quarter telling them that their French father would soon awake and he was shown belts of wampum conveying this message that they had delivered. After returning to Prairie du Chien for supplies, he again went up the Mississippi to the Chippewa which he ascended as far as he could go. He then carried his canoe into a stream flowing into Lake Superior which he named Goddard's River in honor of a well-known Montreal merchant, James Stanley Goddard, who had rendered him some assistance in the course of his journey.

He next visited the Grand Portage where he learned that those who went on the northwest trade were obliged to convey their canoes and baggage overland about nine miles to a chain of small lakes, and relates

that they were in the habit of resorting to Fort La Reine on a river flowing into Lake "Winnepeek" to trade with the "Assinipoils." Coasting along the north shore of Lake Superior and Huron he made his way back to Detroit.

Louis Chevalier, a French Canadian trader, who had acquired great influence among the neighboring tribes continued to reside at St. Joseph's until removed by force during Revolution. His establishment then numbered fifty men, women, and children. By turns trusted and suspected, Chevalier appears on the whole to have been faithful to his allegiance during the contest. Like many others of his calling he had taken an Indian wife and one of his half breed children, Amable Chevalier, rendered important service during the war of 1812.

A member of the noted Lorimier family had a trading-house for many years near the portage from the Miami of the Lakes which became a favorite halting-place for war-parties from Detroit in their raids upon Kentucky. Loraine, La Motte, Richardville, and many other unlicensed traders were permanent residents of Ouiatenon and Vincennes. As at Detroit, most of the inhabitants at those places subsisted by the fur-trade. The furs obtained at Ouiatenon were supposed to be worth £8000 annually. The exports from Vincennes were estimated at £5000. Among the English at least, these settlements had an evil reputation. Croghan in 1765 terms the inhabitants "an idle lazy set, a parcel of renegades from Canada, much worse than Indians." Sir Wm. Johnson five years later speaks of them as "that lawless colony of the Wabash who are daily increasing in numbers and whilst they particularly hate us as English are really enemies of all goverment." Making due allowance for national prejudice these estimates of their character seem fully justified by their contemptible conduct during the Revolution.

The trade of this region however was not undisputed. The merchants of Detroit complained that in 1765 when they were prohibited from going among the Indian villages for fear of renewing their hostility, French and Spanish traders from the Mississippi had come within sixty miles of Detroit and carried off furs for which they had already advanced goods the year before. At the same time, Mr. Fraser who had been sent to take possession of Kaskaskia, found the shops and most of the houses at that place crammed with goods from New Orleans. The merchants in general protested vigorously against any regulations that would prevent them from going among the different tribes, and urged that if these were enforced they would have the effect of diverting the trade from the St. Lawrence and turning it down the Mississippi. Besides the French and Spanish they sometimes had to compete with enterprising English traders

from the southward who were neither hampered by moral nor legislative restraints. An item in the Annual Register for 1767 informs us that "Messrs. Ferguson and Atkins, two Indian traders had lately returned (to Mobile,) from a town eleven hundred miles up the great river Mississippi where they had each married the daughters of an Indian chief and thereby established a mart for beaver's fur, deerskins, &c., from which great advantages were expected."

On the other hand, Sir William Johnson in the light of long personal experience as a trader insisted earnestly on the necessity of regulating the traffic. His correspondence abounds with complaints "of the irregularity with which trade is conducted through the want of sufficient powers to regulate it." The picture he drew of the conduct and character of many of the traders is unpleasing but instructive. "When the Indians are assembled on public affairs," he wrote to the Earl of Hillsborough on the 14th Aug. 1770, "there are always traders secreted in the neighborhood, and some publicly, who not only make them intoxicated during the time intended for public business but afterwards get back the greater part of their presents in exchange for spirituous liquors, thereby defeating the intentions of the Crown and causing then to commit many murders and disorders as well among the inhabitants as themselves." In a speech addressed to him on the 4th of March, 1768, the Indian spokesman had said:- "the rum-bottles hang at every door to steal our lands and instead of the English protecting us as we thought they would do, they employed superior cunning to wrong us; they murdered our people in Pennsylvania and Virginia and all over the country, and the traders begin more and more to deceive."

Again in 1772, Johnson wrote:—"The Indians complain of the great cargoes of rum which of late in particular are sent among them to their ruin as they call it, and beg that it may not be suffered to come near their castles or hunting-grounds. . . . . The complaints made daily by the Indians of the abuses and irregularities of trade are many and grievous and doubtless will be made use of by them in case of a defection in any quarter. . . . . The common traders or factors who are generally rapacious, ignorant, and without principle, pretending to their merchants that they cannot make good returns unless they are at liberty to go where and do as they please. . . . . They are daily guilty of the most daring impositions. . . . . Most of these evils result from the rapid intrusions on Indian lands and the unrestrained irregularities in trade to which I see no period from any steps that are likely to be taken in the colonies."

These complaints referred particularly to the older provinces where

the legislatures declined or neglected to impose regulations, and he congratulated Sir Guy Carleton upon the general absence of these abuses in his government. But unlicensed traders found their way into Canada and Johnson asserted that some of the French Canadian traders were disloyal and were inciting the Indians to hostilities. Canadian merchants whom Carleton consulted denied the charge indignantly, and instanced the general good conduct of their countrymen during Pontiac's war as a proof of their trustworthiness.

In response to many urgent appeals, on the 15th of April, 1768, Lord Hillsborough at length addressed a circular to the Governors of all the British Provinces in America in which he said:—"The objects which upon this occasion will principally demand the attention of the several colonies are to provide by the most effectual laws for preventing any settlement being made beyond the line which shall be agreed upon with the Indians and for the control and punishment of those atrocious frauds and abuses which have been practiced by the traders and have been one principal cause of the disaffection of the savages."

These apparently reasonable and prudent recommendations were either ignored altogether by the local legislatures or resented as an improper attempt to interfere in their local affairs, and five years later his successor, Lord Dartmouth, confessed his utter helplessness to afford a remedy. "As the colonies," he said, "do not seem disposed to concur in any general regulations for Indian trade I am at a loss to suggest any mode by which this important service can be otherwise provided for than by the interposition of the Supreme Legislature, the exertion of which would be inadvisable until truth and connection have removed the unhappy prejudices which have so long prevailed in the colonies on this subject." In the eyes of the typical American historian, a British minister is always the haughty noble, always stupid, always selfish, always insolent. The colonist to whom his policy proved obnoxious is as inevitably the pure patriot, intelligent, firm, and honest. It is not surprising then that this feeble attempt to protect the Indians should often be enumerated among the crimes of a wicked ministry and the worst of motives assigned for it.

Even in Canada the regulations of the governor were systematically evaded and disregarded. This unfortunate state of affairs culminated in the wanton and brutal murder of several Indians among whom were a woman and a child, on the north shore of Lake Erie by a trader of the worst reputation named Ramsay. The murderer was arrested and sent down to Montreal for trial, but after long confinement, had to be released for lack of evidence.*

*For Ramsay's own version of this affair *vide* P. Campbell's travels.

The frontiers of New York and Pennsylvania swarmed with *bos-lopers* (bosch-loopers) the Dutch counter-part of the reckless *coureurs des bois*. The excitement and uncertainty prevailing in all the colonies encouraged them in their defiance of the officers of the Crown and prevented punishment of their crimes.

The Revolution followed and the occupation of Montreal for several months by the Americans in 1775-6 materially dislocated the trade of the province. The adhesion of the western Indians with a few exceptions to the Crown had the effect of cutting off all trade with the settlements south of the Lakes, and the posts of Niagara, Detroit, and Mackinac became of more consequence than ever.

Charles de Langlade and his nephew Gautier de Verville once more led the Indians of the Northwest to the relief of Montreal. They were ably seconded by De Quindre, La Motte, La Bute, and other French Canadians. Alexander McKee and Matthew Elliott, traders of long experience and marked ability, fled from Pittsburg to Detroit where they were at once employed by the Lieutenant-Governor in the Indian Department. Both of them soon acquired an extraordinary influence among the tribes in the vicinity which they retained during the remainder of their lives.

Other traders like Godefroy de Linctot, Hammelin, and McCarty joined the Revolutionary party, but their efforts among the Indians had slight success.

In May, 1777, instructions were issued by the Governor to permit no vessels or boats except those of Indians to navigate the Lakes without satisfactory passports, and prohibiting the construction of any vessel larger than a common rowboat. All vessels already afloat were to be taken into the public service. To compensate the merchants as much as possible for the loss and inconvenience they must necessarily sustain from this arbitrary measure, the commanders of these vessels were instructed whenever possible to assist in transporting their goods free of charge, merely taking an acknowledgement from the owner for the service performed. In the autumn of 1779 when Niagara was threatened with an attack, passes were refused to everybody.

Yet side by side with the military operations, in spite of all restrictions and obstacles, the trade went on with undiminished energy.

A memorial from "the merchants and traders from Montreal to the great carrying-place in Lake Superior and the interior country commonly named the North or Mer de Ouest" presented to General Haldimand in May, 1780, estimated the annual returns from their operations in that

part of the country for a number of years previous at £50,000 worth of furs. They stated that 300 men were employed by them who usually returned to Grand Portage from the interior between the 10th of June and the 15th of July to deliver their furs and receive supplies for the next year. They had not been permitted as in former years to purchase provisions of any kind for the use of these men at Mackinac and Detroit in the autumn of 1779 owing to the increased demands of the garrison and Indians and consequently were obliged to send everything from Montreal, a distance of 1350 miles to Grand Portage, and 1800 miles further to their most remote stations. "Sometimes," they added dismally, "it happens that winter sets in before your Memorialists can arrive at the factories where they intend to pass the winter and when that unfortunate circumstance takes place there are instances of several having starved, and even so direful have the consequences been as to occasion the casting of lots for an unhappy victim to serve as food for his more unhappy companions." This memorial was signed by John Porteous, Holmes and Grant, Simon McTavish, Charles Grant, Todd and McGill, Benjamin and Joseph Frobisher, McGill and Paterson, Forest Oakes, George McBeth, and Adam Lymburner. Most of these ranked among the foremost merchants of the province.

Besides twenty canoes designed to supply the local trade of Mackinac, licenses were issued in 1778 for sixty-one canoes destined for places beyond, exclusive of the northwest trade which was mainly conducted from Grand Portage. These were distributed in the following proportions:—two to Grand River; three to Grand River and the Mississippi; six to the Mississippi; two to the Northwest; twelve to the Illinois; twenty-one to La Baye and the Mississippi; eight to Nipigon; three to Lake Superior; four to Prairie du Chien. Included in their cargoes, were 680 fusees and 29,575 pounds of powder.

The merchants trading in this quarter soon after formed an association which they termed "the general store," having a nominal capital of 29½ canoes and 438,750 *livres* in merchandise. Nine of the partners are named as residing in Montreal, seven at Mackinac, six at the Mississippi, one at each of the following places Akikemazac, Deux Riviéres, Grand River, La Baye, La Point in Lake Superior, Matchedash, Riviére au Sable, St Joseph's, and Saginaw. The principal merchants living at Mackinac were Mathew Lesley, David McCrae, John McNamara, Patrick Duggan, Henry Bostwick, and Benjamin Lyons. Mention is made of Lyons as the owner of houses at the mouth of French River and Alexis Campion is named as residing at Matchedash Bay.

This combination of interests was promoted by Major De Peyster, the

commander of the garrison, with the object of driving out of the country unlicensed traders of whom there seem to have been a good many scattered among the Indian villages. One of these, a negro from St. Domingo, known by the singular name of Baptiste Point au Sable was captured at the River du Chemin, and another rendered desperate by pursuit, blew himself to pieces with a barrel of gunpowder rather than surrender.

In the summer of 1778, a strong body of Virginians took possession of Kaskaskia and followed up their success by the capture of Vincennes; in both instances being joined by many disaffected inhabitants. The principal trade of the Illinois was in consequence diverted from Mackinac to the Spanish posts beyond the Mississippi. A party from Kaskaskia plundered the traders at St. Joseph's, but was pursued and defeated. Hostile Indians and half-breeds instigated by the Spaniards and Virginians constantly menaced St. Joseph's, La Baye, and even Grand Portage.

A small detachment of regular soldiers was sent from Mackinac in 1780 to the latter place where they built a blockhouse for the protection of merchants. Militia officers were stationed at La Baye, St. Joseph's, and St. Mary's, and scouting parties despatched in various directions. Finally two expeditions, each composed of a few regular soldiers and volunteer militia and a considerable number of Indians, were sent against the Illinois and the Spanish frontiers. One of these under Charles de Langlade proceeded by way of Chicago directly to the Illinois. The other commanded by Capt. Hesse (late of the 60th) followed the Fox and Wisconsin rivers to the Mississippi. This party built a stockade at Prairie du Chien where it was joined by a large body of Sioux. They next seized the lead mines and captured some boats with stores, but were afterwards repulsed in attacks on the Spanish forts at St. Louis and Cahokia although they brought off a number of prisoners and inflicted much damage.

Taken as a whole, the trade of Mackinac and all places beyond, including the northwest, produced annually £100,000 worth of furs or about half the entire quantity exported from the province. The cargoes of one hundred canoes, each navigated by a crew of eight men, were required to pay for them. The average value of each canoe-load of goods including the cost of transportation to its destination, but not the payment of wages, was estimated at £700. A considerable variety of goods was needed for successful traffic. Guns, powder, ball, knives, hatchets, rum, and tobacco were in greatest request but a list of articles usually taken includes saddles, spurs, bridles, saddle-cloths, and housings,

morris-bells, razors, combs, looking-glasses, plumes, beads, ribbons, lace of several kinds, hats, laced and plain coats, shirts, shoes, and bed-gowns; six sorts of blankets, handkerchiefs, calimancoes, osnaburgs, cottons, calicoes, muslins, linens, swanskin and embossed serge fabrics; white, black, blue, brown, green and scarlet cloth of several grades; thimbles, needles, thread, pewter-basins, iron pots, brass, copper, and tin kettles, snuff and tobacco boxes, bar iron and steel, silver crosses, finger-rings, gorgets, arm-bands, wrist-bands, buckles, ear-rings, hangers, brooches, moons, earwheels and ear-bobs, beaver-traps, fish-hooks, spears, hoes, and fire-steels. All of these things were brought from Montreal in canoes by way of the Ottawa as this was found to be both a quicker and cheaper mode of transportation than in sailing vessels on the lakes.

As the beaver gradually disappeared from its favorite haunts in the Michigan peninsula both the trade and population perceptibly declined. Many of the inhabitants had emigrated to the Wabash and Illinois where they hoped to be beyond the grasp of the meddlesome English law. The trade then was carried on in a less reputable manner than at Mackinac owing chiefly to the size of the settlement and lawless character of many of the inhabitants.

Lieut.-Governor Hamilton reported shortly after his removal in 1776 that "regulations for the trade with the Indians are either not generally known or not enforced. For example great abuses exist in the weights and measures used by the traders and for want of an office to stamp the silver-works which make a considerable article in the trade with the savages, they get their trinkets so debased with copper as to lay open a large field for complaint.

"The number of traders not being limited allows of many engaging in it who have no principle of honesty and who impose on these poor people in a thousand ways to the detriment of honesty and to the disgrace of the name of *trader* among the savages which usually means with them an artful cheat. The distrust and disgust conceived for these traders occasion many disputes which frequently ended in murder. This trade being lucrative engages several who have little or no capital of their own to procure credit sometimes to a considerable amount, their ignorance, dishonesty, (or both) occasion frequent failures; the adventurers then decamp to some other post where they recommence the same traffic improving in art and villainy, and finally become desperate in their circumstances and dangerous from their connections and interest with the savages."

Bad as these men may seem, their *engagés* were infinitely worse. "They are" says Hamilton, "the most worthless vagabonds imaginable.

They are fugitives (in general) from Lower Canada or the colonies who fly from their debtors or the law, and being proficient in all sorts of vice and debauchery corrupt the morals of the savages and communicate to the wretches disorders they might have continued untainted by, were it not for the intercourse with these *engagés*. Having contracted new debts, they fly to the more remote posts where they recommence the same rade."

The population of the settlement did not exceed 2100 of whom 127 were slaves. The French Canadians he described as easy-going and illiterate, few of them being able to read and still fewer to write their town names. "They build on the borders of the Straight, and occupy about thirteen miles in length on the north and eight on the south side. The houses are all of log or frame work, shingled. The most have their orchards adjoining; the appearance of the settlement is very smiling."

The new settlers on the other hand were active and enterprising. They had introduced sheep and black cattle and their farms were managed to the best advantage. All the large vessels on the lakes were owned by them and he anticipated that in a few years the Canadians would be compelled to part with their lands and become reduced to the condition of dependents. It is stated, apparently on good authority, that there were then only thirty Scotchmen, fifteen Irishmen, and two Englishmen in Detroit, exclusive of the garrison, but the greater part of the trade of the place was already in their hands.

The population was considerably increased during the war by the arrival of fugitives and prisoners from the frontier who were encouraged to settle on lands in the vicinity. Indian parties accompanied by white officers were constantly sent out to harass the borders of Virginia and Kentucky and traders followed in their trail with packhorses as far as the villages near the Ohio. The portage from the Miami of the Lakes to the Wabash had been made passable for carts and the exclusive right of carrying goods was granted to Mr. Maisonville of Detroit.

At Niagara there was not a single inhabited house outside the walls of the fort. Glimpses of the state of trade and the life of a trader at that post during the Revolution are found in the correspondence of Francis Goring.

Writing on the 23rd of Sept. 1779, he says:—"I have lived at this place three years last August, and have had two masters in that time and am now getting a third, still in the same house. The first was Mr Pollard, he made a great fortune and left off. The second, Mr Robison, who was formerly a captain on these lakes, is now tired of business and assigns

in favour of George Forsyth who has treated me with the greatest kindness and is ready to serve me in anything I should ask. I have had several offers by my two old employers to leave Niagara and live with them in Canada, but I believe I shall continue here which I prefer to Canada, the popular place where everything is carried on with the greatest gaiety, and this is a place which you may say is almost out of the world, in the woods, and frequented by nothing but Indians except the people of the garrison. . . . . At this place is carried on a great business which consumes every year £30,000 sterling worth of merchandise of all sorts which is mostly retailed to the Indians. We employ four clerks of which I am the senior. For the first two years my salary was but small, but I have now (and I flatter myself that there is not a clerk in these parts that has so much) about fifty guineas per annum, being found food and washing. By carrying on a correspondence with my friend Mr. Cruikshank who supplies me with silver work, such as the Indians wear, which I dispose of to the merchants in the upper country, and the profit arising therefrom is sufficient to find me in clothes."

In 1767, Sir William Johnson reported the presence of unlicensed traders at Toronto, but it seems to have been abandoned altogether as the trading-station soon afterwards. Even the trail leading to Lake Simcoe was little used, and the Trent valley route became almost forgotten. Benjamin Frobisher said in 1785:—"I have seen several persons who have gone from hence (Montreal) to Lake Huron by the carrying place of Toronto, but have only met with one who set out from the Bay of Kentie and that so far back as the year 1761 and the knowledge he seems to have of the country he travelled through I consider very imperfect."

The commerce of Oswego had steadily declined since the conquest. Instead of forty or fifty traders as in 1750, but one named Parlow remained in the summer of 1779. His property was pillaged and his buildings burnt by a party of Americans and Indians sent for that purpose from Fort Stanwix and he then took shelter in the small fort recently built on Carleton Island. Other traders followed him there and for a few years a fair trade was carried on with the neighboring Indians.

The continuance of the war occasioned everywhere an enormous rise in prices and a great scarcity of imported goods.

The scarcity of coin and in fact of any medium of exchange probably accrued to the benefit of the traders. Gold, silver, and even copper coins of most Euopean countries passed current. In addition to the ordinary French and English pieces, Spanish moidores, pistareens, pistoles, and dollars, the Johannes of Portugal and Caroline of Germany were in common circulation.

LAKE CURRENTS.

By L. J. Clark.

(Read, 23rd April, 1892.)

At a meeting of the Canadian Institute, held April 4th, 1891, the following resolution was passed, on motion of the writer seconded by Mr. A. Macdougall:

"That before any further steps be taken to promote the construction of a 'Trunk Sewer,' it is necessary that more definite, and precise information be obtained regarding the currents of the lake between the mouth of the Humber, and the south side of the Island and Victoria Park."

"That the City Council be requested to take a series of Float Observations for a period of at least three months, extending through the summer and a portion of the fall—say from July till October—with temperature observations of the water at various depths, and readings of the velocity and direction of the wind, taken on the lake at the same time the floats are put in; these floats to be placed in deep water, commencing at thirty, feet in depth, and extending to sixty feet, or even deeper."

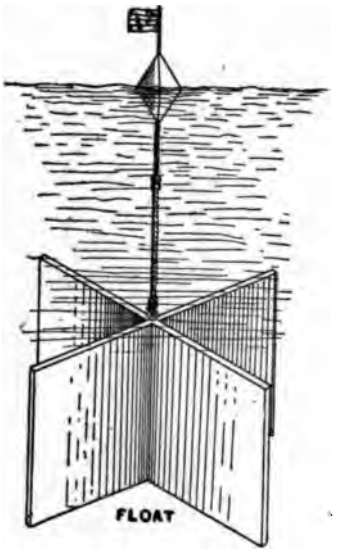
"That the co-operation of the Provincial Board of Health, and the Board of Trade be enlisted; and that a copy of this resolution be sent to each of the boards and to the City Council; and that a delegation consisting of Professor Carpmael, Dr. Canniff, Mr. A. Harvey and the Mover and Seconder be appointed to bring the matter before the above named corporate bodies."

In pursuance of the above resolution the matter was brought to the attention of the Boards of Health and Trade respectively, and unanimously endorsed by them. Also a committee was nominated by each body to co-operate with the committee from this Institute to bring the matter before the City Council. Mayor E. F. Clarke arranged for a meeting with the City Engineer, W. T. Jennings, at which the subject was duly discussed, with the result that the engineering department undertook, with the assistance of the departments under Professor Carpmael and Dr. Bryce, to carry out the investigations referred to, the former to supply data from the Observatory in regard to the direction and velocity

of the wind, while the latter was to make a thorough analysis, both chemical and bacteriological, of samples of water taken from the various points.

The investigations were carried out under the directions of Mr. C. Rust, Assistant Engineer, and N. Kerr, of the Engineer's department, Dr. Mackenzie, of the Provincial Board of Health, and the writer on behalf of the Institute. On the first trip, besides the above named gentlemen, Professor Carpmael, Arthur Harvey, President of the Institute, Mr. Hamilton, Manager of the Waterworks, and Mr. R. W. Elliot, of the Board of Trade, accompanied the expedition; and on many of the subsequent trips, scientific gentlemen and interested citizens showed the importance which they attached to the investigations by joining in, and giving the benefit of their suggestions to, the work.

The apparatus used for ascertaining the direction and velocity of the currents was a float or drag made of two cross brackets of wood covered with linen, a rope of from twenty to sixty feet attached, to suit the required depth, and a tin float surmounted by a flag, and numbered. The floats were made of different sizes, the arm pieces of the brackets varying from two and a half feet to five feet in length, and the canvas from 27 to 54 inches in breadth. These drags required to be nicely adjusted by hanging weights to them to keep them in position, and it sometimes occurred that we would lose a float, flag and all, by weighting it a little too heavily.



Stations were placed nine in number along the city front from the mouth of the Humber to Victoria Park in water ranging from thirty to sixty feet in depth, as follows, No. 1, in Humber Bay, off West Toronto Water Works; No. 2, half way between No. 1 and the mouth of the new intake; No. 3, at the intake; No. 4, outside the Island in a line with Church Street; No. 5, south of the Eastern Gap; No. 6, off Ashbridge's Bay in a line with Leslie Street; No. 7, off the Woodbine; No. 8, half a mile off Victoria Park wharf, and No. 9, one mile south of No. 8, in 70 feet of water.

A couple of sextants, a good marine glass, a sounding line, a supply of glass-stoppered bottles with apparatus for taking deep water samples,

and a couple of self-registering thermometers, together with one for taking deep sea temperatures completed our outfit. The deep sea thermometer referred to, was supplied by Professor Carpmael from the Observatory, and was of a pattern specially designed for taking observations on the ship Challenger on its voyages of deep sea investigations; it was made by the celebrated firm of Zambra and Negretti.

Our *modus operandi* was to start from Church Street wharf, about 9 a.m., on board the Ada Alice and visit our stations, take samples of water, record the temperatures, and put out generally two floats at each station; then come in between 12 m. and 1 p.m., and start out again at 2 p.m., and pick up our floats, taking observations by means of the sextants of their location when taken up. These positions were afterwards plotted on a map, showing by means of lines and arrows the direction and distance the floats had moved. The direction and velocity of the wind was afterwards obtained from the observatory for the corresponding days and the whole tabulated as follows:—

DATE.	Depth of Float.	Mean Velocity, and Direction of Wind.			Direction Taken of Float.	Distance Travelled in Miles.	Time in Hour and Min.	Distance Per Hour in Miles.	LOCATION.
		9 a.m.	1 p.m.	4 p.m.					
	feet						H. M.		
July 2	20	2 E.	6 E.	6 E.	S.W.	0.20	4.15	.047	Leslie Street.
" 6	16	7 W.	10 S.W.	10 S.W.	NNE	0.50	6.25	.08	Eastern Gap.
" 8	30	12 N.	14 N.	6 N.	ENE	.94	5.40	.17	Leslie Street.
" 9	25	6 S.W.	6 S.W.	7 S.W.	S.W.	2.06	5 30	.37	" "
" 10	25	4 W.	4 S.E.	7 S.W.	S.W.	2.38	7.30	.31	" "
Aug. 17	30	4 E.	3 E.	8 E.	S.W.	1.55	6.10	.025	" "
" 18	30	Calm	8 S.	10 N.	S.W.	3.03	4.10	.72	2 m's S. of Vict. P'k.
" 19	30	5 E.	7 E.	10 E.	S.W.	1.00	5.35	.18	W. of Island.
Sept. 1	20	1 W.	14 S.E.	11 S.	E.	0.50	4 05	.12	Eastern Gap.
" 7	20	4 W.	9 S.	13 N.W.	S.E.	.77	4.30	.17	Woodbine.

The observations were continued altogether about 35 days, viz.: 8 days in July, 5 in August, 9 in September and 11 in October. Some days the lake was so rough it was impossible to continue our operations; on the 3rd of July, having got as far as the Eastern Gap we were compelled to turn back owing to the quantity of water shipped by the Ada Alice. It

was unfortunate that we had not a boat that was capable of standing a rougher sea, as that is the very time when the required information would be most valuable. The highest velocity of the wind we were able to operate in was 25 miles per hour.

While the currents seem to be under the influence of the winds to some extent, there is considerable lack of uniformity, particularly at different stations; for instance, the currents in the Humber Bay did not conform to the same general principle as at other stations; also, the currents at the Eastern Gap seemed to be different from those to the east and west of it. But one thing seems to be pretty clearly proved, that the general direction of the currents is paralled to the coast line from Victoria Park to the western extremity of the Island, that is N.E. and S.W. nearly. Thus North East, East, and South East winds pretty generally produce currents flowing South West, while South, South West, and West winds give North Easterly currents, and North and North West winds give rise to variable currents; thus on seven occasions when the wind was from the North and North West the resulting currents were two North East, three South West, and two South East. Also a South West wind would produce a North East current south of the Island, and a North West one west of the Island. The phenomenon of the current being in a contrary direction to the wind was more marked in Humber Bay than to the south of the Island; although on one occasion, on the 17th of July, we put out, near Victoria Park, first a 30 feet float, second a surface float without flag or drag, a mere tin can with an iron rod, four feet in length, attached, and third an empty tin can; the wind was fresh from the East; the first and second floats went dead against the wind, while the empty can was driven along before the wind on the tops of the waves. Close in shore we sometimes observed the current in an opposite direction to that farther out.

Instances of counter under-currents were obtained from Mr. J. Raynor and Mr. J. G. Rosesseau, fishermen at Niagara. They informed us that when they had their nets out in deep water during the prevalence of strong easterly winds, they would find in drawing in the nets that any floating submerged leaves or weeds would be caught on the opposite side of the net, showing that the under-current was from the West. This would indicate that the waters, being driven to the West, pile up at Burlington Beach and the head of the water thus raised forces a portion of the water back as an under-current. This would be more noticeable in Humber Bay if it were more closed in by Mimico point. Instead of giving the reverse undercurrent close in by the shore, it would probably be found out in a couple of hundred feet or so of water.

We made a trip to the mouth of the Niagara river to ascertain if

possible how far the current of the river could be traced across the lake. We put out a number of floats inside the bar and in the mouth of the river, but unfortunately we gave the floats too much line and most of them grounded on the bar; one or two that got over safely took an easterly direction. There is a distinct color line dividing the water inside the bar from that outside, and the difference in temperature is very marked. In the river, both at the surface and at the bottom the temperature was as high as 69° or 70°, while outside, at the depth of 400 feet, we found the water at its maximum density or 39·5° Fh. This accounts for the coolness of our water supply in Toronto; although it primarily comes through the Niagara river and is heated up to the point already indicated, before it reaches us it has to come over that cold sub-stratum of water, at least for thirty miles; so that at the intake in the month of July, we found the temperature as low as 43°; in October it was observed to be the same, and only slightly higher in August and September.

As the practical outcome of these investigations is to ascertain with what degree of safety sewage may be deposited in the lake, it becomes necessary to consider another factor that enters into the question, viz., the effect of diffusion upon sewage. The share of the work, in these investigations, carried out under the superintendence of Dr. Mackenzie, on behalf of the Provincial Board of Health, will afford material aid in solving this problem; the substance of which will be found in the following quotation from Mr. Rust's report. "To ascertain, if possible, from actual tests, how rapidly diffusion and oxidation take place, Mr. Mackenzie, on the 16th October, took samples of water, in a direct line from the mouth of the intake to the outlet of Garrison Creek sewer, which discharges 400,000 cubic feet, per day. I attach a copy of the results, by which you will see that the sample taken within a little over half a mile of the mouth of the sewer came within the limits of first-class water; the wind on the occasion was from the North, which would tend to carry the sewage direct to the intake. This shows very favorable results, and tends to prove that there will be no possible danger of contaminating the water supply if the sewage be discharged into the lake at a distance of six miles east of the intake. When the population of the city exceeds 500,000, and it is found that there is the slightest danger to the water supply, precipitation works could be erected and the sewage treated by chemical means." The copy of the schedule referred to shows that a sample of water taken near the mouth of the sewer showed a degree of organic impurity by Muter's scale of 2·44 per million, while first class water should not show above ·25. It also showed as high as 40,000 bacteria per cubic centimetre; yet we find that within half a mile, this water is raised to a standard of first class purity. We can then judge of

the immunity from danger there would be if the sewage outlet were removed to a distance of six miles.

I make one further quotation from Mr. Rust's report. "I feel satisfied from the results of the experiments that the currents are caused by the winds. They change direction as the wind changes, although sometimes after a sudden shifting of the wind, the upper and lower currents have sometimes different directions. By the attached tables you will see that during this fall there has been a great number of days in which the wind blew from an easterly direction, and to this is to be accounted the large percentage of floats which drifted in the direction of the intake pipe. From the Observatory reports we find that the prevailing winds are from a westerly direction. The Hon. W. McAlpine and Messrs Hering and Gray, in their reports on the Trunk Sewer, considered that the sewage could safely be discharged into the lake east of the intake pipe."

With the above views I entirely agree and am of the opinion that the mouth of the intake pipe is in about the best possible position, as it is the nearest point to the shore where a depth of seventy feet of water can be reached; and double that depth is found within a few hundred yards to the South. The force of this will be seen when you refer back to that part of my paper where I drew your attention to the fact that the prevailing direction of the currents was about parallel with the coast line. Now as the mouth of the intake is less than half a mile from the shore of the island, it stands to reason that if we take our outlet pipe a *mile* from the shore line we get our sewage a half a mile outside of the range of the inlet pipe. Herein, I believe, is perfect safety.

And when we consider the immense advantage it will be to us to get clean rid of the whole foul mass of sewage without creating plague spots in our fair city, in the shape of sewage farms or what is worse, precipitating works without regard to the enormous cost of such works we are constrained to say, "'Tis a consummation devoutly to be wished."

There is yet required to be made a careful and thorough investigation into the extent to which diffusion takes place in large bodies of water and its effects on sewage. The Council, on recommendation of last year's Trunk Sewer Committee, are partly pledged to undertake that work this year.

In conclusion I beg to say, that as the Institute was instrumental in having these valuable preliminary investigations made by the Council, I hope the members of the Institute, individually, as well as collectively, will continue to use their influence to help on the great work of a perfect system of sewage disposal, for which Toronto is languishing.

THE PRIVATE CORRESPONDENCE OF LIEUT.-COL. COFFIN, DURING THE REBELLION OF 1837.

By H. R. Fairclough, M.A.

(Read 12th March, 1892.).

It has been my great privilege to read a packet of letters written by the late Lieut.-Col. Coffin. Though I never knew or even saw the writer, still so vividly does the man's noble personality appear between the lines he penned, that I feel drawn towards him as to a friend, the touch of whose vanished hand, and the sound of whose voice, now still, the pages perused have in no slight measure supplied. The individuality of the writer I have been able to picture to myself still more fully, through the many conversations I have had with several of his intimate friends and relatives, particularly one, the lady to whom a number of the letters before me are addressed. It is because Col. Coffin was so well known and highly esteemed in Canadian public life, and because his letters deal with public events at an extremely critical period of our national history, that I have taken the liberty of bringing this interesting correspondence before the notice of the Institute.

Col. Coffin* came of a fine old stock. Burke, in his "Colonial Gentry," speaking of the Coffin family says that "Sir Richard Coffin, Knight, accompanied William the Conqueror from Normandy to England in the year 1066, and the manor of Alwington, Co. Devon, was assigned to him."

Though, on the face of it, this statement is absurd, still it indicates the

*William Foster Coffin was born at Bath, Somerset, England, in 1808. In 1813 came with his father to Canada, but returned to England, 1815. Entered Eton College, 1817. Won an Eton Postmastership at Merton College, Oxford. Returned to Canada, 1830. In 1835 was called to the Quebec bar. In 1838 was appointed Assistant Civil Secretary, and actively assisted Sir John Colborne in allaying civil strife. In 1839 was appointed Stipendiary Magistrate at Ste. Marie, a disaffected district, and in 1840 Commissioner for Police in Lower Canada. In 1842 became Joint Sheriff for District of Montreal, but resigned this position in 1851. In 1856 was made Manager of Ordnance and Admiralty lands, a position which he held until his death in 1878. Was offered but declined the Lieut.-Governorship of Manitoba. Acted on numerous government commissions. Raised and commanded the Montreal Field Battery, 1855, and was promoted to the rank of Lieut.-Colonel. Was a member of the Royal Institution and a Governor of McGill College. His published literary work includes a "History of the War of 1812 (Montreal 1864) and "Thoughts on Defence from a Canadian Point of View" (Montreal 1870) He married a daughter of Deputy Commissary-General Clarke, a near relative of Lord Lyndhurst.

antiquity and nobility of the family. The ancestral home of the Coffin's is Devonshire—a county which, as readers of Kingsley's "Westward Ho!" are well aware, has given England so many of her sailors and soldiers.

In the middle of the last century, some members of this family were settled in Boston, Mass. On the breaking out of the Revolutionary War they refused to desert the old flag, and John Coffin, Col. Coffin's grandfather, with nine children went to Quebec, where he distinguished himself during the siege of 1775. On the 31st Dec. in that year he kept the guard at Près de Ville under arms, and with great coolness, at the critical moment directed Capt. Barnsfare's fire upon the invading forces. "To him," thus writes General Sir Guy Carleton, afterwards Lord Dorchester, "with the assistance of Barnsfare, I attribute the repulse of the rebels on that side of Quebec, where Mr. Montgomery attacked in person."

Col. Coffin's grandfather had six sons and four daughters. One of the former, Francis, became an admiral in the British navy; another, Nathaniel, died Adjutant-General of Militia of Upper Canada; another, the Hon. Thomas Coffin, was a member of the Legislative Council of Lower Canada. The second son, William, was a captain in H. M. 15th Regiment of Infantry, and at the time of his death, in 1835, had Brevet Major rank. He married a Mrs. Austin, whose maiden name was Foster, and it is their son, William Foster Coffin, who wrote the letters that are the subject of this paper.†

Before I leave the Coffin family, it may be well to shew briefly who the relatives are to whom these letters are directed, and to whom Col. Coffin was so warmly attached.

A brother of John Coffin, who also lived in Boston, Mass., but at the time of the Revolution made England his home, had three sons, John, Isaac, and Nathaniel. Isaac became an admiral in the British navy and for his most distinguished services was created a baronet, and given the Magdalen Islands. John, afterwards Gen. John Coffin, settled in New Brunswick. He had a family of eight, three sons and five daughters. Two of the sons became admirals in the navy, the other a general in the artillery. Of the daughters, Anne, married Major, afterwards Sir Thomas, Pearson, well known for the part he took in Canada in the war of 1812, while Mary married Charles Ogden, Solicitor-General, afterwards Attorney-General, of Lower Canada. The eldest daughter, Carolina, married the Hon. Charles William Grant, afterwards Baron de Longueuil, son of the Baroness de Longueuil in her own right and Captain

†Of the daughters of John Coffin, the third, Margaret, married her cousin, Lieut.-Gen. Sir Roger H. Sheaffe, Bart., who fought at Queenston Heights, and on the death of Gen. Brock took command and completed the victory.

David Alexander Grant, of Blairfindy, Scotland. The children by this marriage were Charles Irwin Grant, Baron de Longueuil, who died in 1878, and Charlotte, who is married to Mr. J. Antisell Allen, both of whom are living in the beautiful old home of Alwington, in Kingston, Ont., for some years the residence of the Governors-General of Canada.

It is to Carolina, Baroness de Longueuil, and her daughter Charlotte, that the letters in the packet are addressed.

The correspondence to which I have had access covers a period of over six years, from January 24th, 1834, to March 17th, 1840. There are twenty-six letters in all, and, being written to intimate friends and relatives, they naturally contain much that is of merely family and personal interest. But there is also a great deal that must be interesting to Canadians in general, and it is chiefly the writer's account of and frank comments on the exciting political events of the day that I desire to bring before your notice.

At the outset let me utter a word of caution. Even to-day a narrative of the incidents of 1837-38 can awake not a little intensity of feeling, and it is but natural to expect that a young man, living in the midst of those events, should feel the heat of party strife and express the sentiments of an ardent partisan. But herein lies the value of these letters. It is often difficult to understand and estimate fairly the principles and sentiments of both sides in a political struggle, and this holds more true the farther the contest is removed from our own time. To-day Canadians of all parties give their unqualified assent to the principle of responsible government, and it is not always easy, therefore, to appreciate the honesty and sincerity of those who in former days so bitterly denounced William Lyon Mackenzie. Yet the latter lived to acknowledge himself that it would have been a misfortune for Canada if all his plans had succeeded. In any case let us bear in mind that in Lower Canada the struggle of '37 was very different in character from that in Upper Canada —that it was chiefly a racial strife, and involved questions which, as recent events have shown, are even yet unsettled. Col. Coffin was an enthusiastic loyalist, and to his mind the problem to be solved in Lower Canada in the earliest years of Queen Victoria's reign was whether the work of Pitt and Wolfe was to be undone, and the tricolor was once more to float over the citadel of Quebec. His views as expressed in these letters, were undoubtedly the views of a great majority of the British population in Lower Canada at that time, and therefore deserve, to say the least, a respectful hearing. Only by studying both sides can we get the proper historical perspective.

As a fitting introduction to the narrative of hot conflict and fiery strife, which is to follow, the first letter gives a most vivid description of the burning of the Château de St. Louis, at Quebec, on January 23rd, 1834. This castle had been used as the residence of the Governors of Canada for upwards of 150 years. It was never rebuilt.

In 1835, when the troubles in Lower Canada were coming to a head, Sir Robert Peel determined to appoint a Commission of inquiry, but his term of office was too short to allow him to carry out his intentions. These, however, his successor, Lord Melbourne, fulfilled. The Lord High Commissioner appointed was the Earl of Gosford, while Sir Charles Grey and Sir George Gibbs were made assistant commissioners. Shortly afterwards Lord Aylmer, who was administering the Government in Lower Canada, was recalled, and the Earl of Gosford took his place as Governor-General. Lord Gosford arrived in the frigate Pique at Quebec, on August 23rd, 1835, and in a letter written a month later, on September 26th, the Commissioners are humorously described by Col. Coffin, who also indicates the political unrest then prevailing in Canada, and complains of ignorance at home respecting the Colonies.

"Parliament meets next month for the deliberate legal annihilation of British interests. . . . As you may imagine the proceedings of our new rulers are the subject of much anxious speculation. As yet they are secret and mysterious. The people themselves look as if burthened with some mighty secret, or as if environed with the web of some frightful conspiracy. Everything they attempt is *a tatons*. They walk like so many cats upon thin ice, slipping at every step and fearful lest the next may plunge them beneath the surface. This is the natural consequence of the terrorism which has been exercised by Roebuck and his mendacious accomplices in England, who have impressed the British public with the belief that the Canadians, goaded by the tyranny of the English population, were in a state of actual revolt. An officer of the Pique assured me that previous to their sailing it was a matter of general surprise that the commissioners had not been backed by an extra regiment or two. Nothing in fact can be compared with the gross and shameful ignorance that generally prevails respecting these Colonies. The meeting of the Assembly will alone satisfy the existing curiosity which amounts to a wish to know 'the worst at once,' and then we shall find that all this disturbance has been created and all these undignified personages have been sent from their dull homes across the wide Atlantic, for the simple purpose of proving the fallibility of some infallible panacea for Canadian grievances. On the principles they profess they cannot do good and must do harm.

"Lord Gosford is a most unaristocratic looking lord. I have seen many a farmer with more of the air of a gentleman. He is of quarto size and dimensions, with a very tropical complexion, being much of the hue of a nutmeg. They say that he is good-natured and accessible, that he delights to walk about with his hands in his breeches pockets, or to relax from such absorbing occupation by a sly game at pitch farthing with the little boys under the château wall. Sir George Gibbs—did you ever hear such a name—is an engineer officer suddenly metamorphosed into a diplomatist. His trade

is that of springing mines, let him beware that the present does not explode beneath his own feet. Sir Charles Grey is the *beau-ideal* of a Leadenhall butcher. We are told that he is a very good man, but he looks like a very vulgar one. They go here by the name of the three G's—gander, goose and gosling."

It was just a month after this letter was written, when the Parliament of Lower Canada assembled. Lord Gosford, in a very conciliatory speech, assured the House that all real grievances would be attended to. "The Home Government" he said "was prepared to surrender the control of all public revenue arising from any Canadian source, on condition of a moderate provision being made for the Civil list. Plurality of offices should be abolished, and intelligent French Canadians have the paths to positions of honor and profit open to them, equally with the English-speaking races; in future the fullest information with regard to the public accounts would be given the House; no bills would be reserved for the royal assent where it was possible to avoid it, and all complaints should receive due consideration."

But no concessions could please Mr. Papineau and his followers. They ignored the Royal Commission and appointed Mr. Roebuck their agent in England to press their grievances before Parliament. The Legislative Council throwing out this bill, Mr. Papineau indulged in some violent language. "The time has gone by" he said "when Europe could give monarchies to America; on the contrary, an epoch is approaching when America will give republics to Europe."

A supply bill for only six months was voted by the Assembly, but rejected by the Council, and the Governor in proroguing Parliament had to acknowledge his failure and consequent disappointment. "It is to me matter of sincere regret that the offers of peace and conciliation, of which I was the bearer to this Country have not led to the result which I had hoped for. The consequences of this rejection, and of the demands which have been made to his Majesty, I will not venture to predict."

Meanwhile Sir Francis Bond Head had assumed office as Governor of Upper Canada. He arrived in Toronto at the end of Jannary 1836, while the house was in session, and though announced in advance as "a tried Reformer," he soon showed that he had little sympathy with such Reformers as Mackenzie and Bidwell, who not content with airing their just grievances, resorted to veiled threats of secession and leagued themselves with Papineau and the Lower Canadian "Patriots," who were already preparing to resort to arms.

Finding that the new Governor would not become their tool, the Assembly cut off the supplies, but Sir Francis after refusing his assent to any money bills whatever, so that the members had no sessional allowance to

draw, prorogued Parliament on the 20th April, and a month later dissolved the House and issued writs for a new election.

Public opinion was evidently opposed to the extreme measures advocated by the reform leaders, for in the ensuing contest the party, which in the last house had a large majority, was overwhelmingly defeated, and most of the leading men were beaten.

The joy with which this news was received by ardent loyalists throughout the country may be inferred from the words of Col. Coffin. Writing from Montreal, he says:—

"Hurrah for the Hero of the Pampas!* His jockeyship has stood him in good stead, and most sincerely do I rejoice at his victory. I only hope that he will know how to use it in moderation and wisdom. I am not infidel enough to doubt of such a man, but rest assured the most trying part of his task is yet to come. Everything is expected from him, and one false step may provoke a radical reaction which will make the Upper Provinces a territorial appendage to the United States in the course of a year. But—deuce take the clever fellow—he soars above misgiving. The people here and at Quebec are about to sacrifice whole hecatombs in his honor in the guise of public dinners."

Mr. Coffin himself, however, kept aloof from these demonstrations "being determined neither to eat, drink, or speak politically for a long time to come."

In Lower Canada the Legislature again met on the 22nd September. Lord Gosford announced in a dignified manner that the Home Government desired to give the members another opportunity of reconsidering their action, and he trusted they would vote the supplies in the proper manner. In the address in reply the Assembly did not refer to the question of supplies, but simply demanded that the Council should be made elective. Shortly afterwards a despatch from Lord Glenelg, Colonial Secretary, informed the House that this principle could not be admitted, but notwithstanding, the Assembly resolved to transact no business until the Council had been made elective. The result was a deadlock, and Parliament was prorogued.

In accordance with the report made by the Royal Commission, resolutions were proposed in the British House of Commons on the 6th March, 1837, to the effect "that it was unadvisable to make the Legislative Council of the Province elective; but that it was expedient that measures be adopted for securing to that branch of the Legislature a greater degree of public confidence." The Executive of the Province was authorized to use the public money of the Province for necessary expenses.

* That is, Sir Francis, who was known as "Galloping Head" from the "Rough Notes" he published in 1826 describing several journeys across the Pampas and the Andes.

At this the Patriot (so called) party was roused to deep indignation; meetings for remonstrance were held frequently and in various places, and Papineau and others made hot revolutionary speeches. The excitement was intense, and at its height when William IV. died, and Queen Victoria ascended the throne. On August 18th, Lord Gosford assembled Parliament once more. The Governor made a dignified speech. The Home Government, he said, wished to give them another opportunity of considering their action before the Imperial authorities passed an Act which would deprive the Provincial Legislature of that control over its own revenues which it was desirable that it should have, " a result for the attainment of which Her Majesty's Government would willingly make every sacrifice, save that of the honor and integrity of the Crown." In the address in reply, presented eight days later, the Assembly pressed their former demands with more persistence than ever, and warned the mother country that if she carried her resolutions into effect her supremacy in British America would no longer depend " upon the feelings of affection, of duty, and of mutual interest " but upon " physical and material force." Her exercise of power was compared with that of " the most despotic governments of civilized Europe." Lord Gosford regretted the obstinacy of the Assembly, and dissolved the House by proclamation.

Many were the appeals now made by Papineau and his followers for the people " to lay down their lives on the altars of their country." It was clear that blood must be shed, and both " Patriots " and " Loyalists" began to prepare for the coming struggle. On the 6th November the first conflict took place. The so-called " Sons of Liberty " were leaving the place where they had been assembled, when they were met by a small number of members of the Doric Club, and a general fight ensued. This was followed by an attack upon the house of a Mr. Idler, where the Sons of Liberty met, the wrecking of Mr. Papineau's home and the sack of the office of the *Vindicator*. The Riot Act was read, and the magistrates of Montreal and Quebec issued proclamations forbidding the assembling of bodies of men for drill, and prohibiting " all public meetings and processions which are of a nature to disturb the public peace." A new commission of the peace was issued for the district of Montreal, which removed sixty-one magistrates suspected of disloyalty.

Meanwhile the troops were being concentrated in Montreal, where Sir John Colborne, now Commander of the Forces, had fixed his head-quarters. Not only New Brunswick and Nova Scotia sent aid, but even Upper Canada, through Sir Francis Head, despatched all the regulars in the Province, the Governor having determined to rely wholly on his militia.

Earl Gosford, on the 16th November, issued warrants for the arrest, on a charge of high treason, of Messrs. André Ouimet, J. Dubuc, François Tavernier, George de Boucherville, Dr. Simard, J. Leblanc, L. J. Papineau, Dr. O'Callaghan, T. S. Brown, Rodolphe Des Rivières, and Ovide Perrault. Of these the last five managed to escape.

On the same day (16th Nov.) the Montreal Volunteer Cavalry, under command of Lieutenant Ermatinger, were despatched to St. John's to arrest two men named Davignon and Demaray. They had secured their prisoners and were returning to Montreal when about a mile from Longueuil they were met by some 200 men, armed with rifles and muskets, who opened fire on the troops, wounded the commander and five men, and finally rescued the prisoners.

In a letter dated November 17th, Montreal, Mr. Coffin speaks of this event :—

"These are queer times for quiet people. Things bear a very unpleasant appearance in this part of the world. I would not say dangerous, but certainly disagreeable. . . . Warrants have been issued for the arrest of several individuals in this City and District on charges of High Treason. In town we have been successful enough in bagging a few ;—to counterbalance this success, the Montreal Volunteer Cavalry, which was employed as a constabulary force, having been despatched to execute similar warrants in the vicinity of St. Johns, and having accomplished the object of their expedition, were attacked on their return by about 200 armed *habitants*, and after having had four of their number wounded were compelled to relinquish their prisoners and retreat, which they did in good style, and, considering that there were twenty-two only in number opposed to such enormous odds, in a manner which reflects much to their credit. This reverse will doubtlessly be magnified into an utter defeat of all the British troops in the Lower Provinces by the force of the "nation Canadienne." To reassure you on this head I give you the facts. The state of public feeling is very uneasy in this district ; the Canadians appear cowed in town, but they have shown pluck and preparation in the country. I have since I wrote the last word seen a very bright and handsome pewter ball which has just been extracted from the leg of one of the volunteers—an awkward customer I promise you. The British are, as you may suppose, very much exasperated. Should any disturbance take place, blood will be spilt, and such an occurrence may be hourly expected. The non-appearance of the troops which had been ordered from Halifax and the West Indies has placed Government, I should imagine, in a dilemma. If things proceed much longer in the same train the Kingstonians may before long find themselves called upon to perform what they have so recently promised.

"I must condole with Mr. Grant that the first act of rebellion should have been committed on his property. At the same time you may congratulate yourselves that you are safe at Kingston, and moreover that you have something to the fore there let the worst happen."

The next letter, written three days later than the preceding, acquaints us with some more of the stirring events of this exciting month :—

"On Saturday" (*i.e.* Nov. 17th) "four companies of the Royals and two pieces of artillery were despatched to Chambly. Some of the Police accompanied them for the purpose, if possible, of identifying any of the insurgents. They met with many indications of a rebellious spirit—had a slight skirmish in the woods with some armed *habitants* and took seven prisoners. This appears for the moment to have created a panic, but I have grave doubts whether the effect will be permanent. It is evident that the peasantry has been extensively provided with arms and ammunition, and systematically instigated to resist the authorities. There can be also no doubt that with their immense numerical superiority, if they only knew their own strength and how to direct it to the best advantage, they might prove ugly customers. Until they receive some terrible lesson, I doubt very much whether they will be reduced to consult their own discretion. As yet they appear to obey their leaders implicitly. . . . Debartsch has been compelled to make his escape from St. Charles. T. S. Brown and Rodolphe Des Rivières have since taken possession of his property with many of the insurgent inhabitants of that vicinity. They are deliberately fortifying themselves in his house, throwing up fieldworks and making divers other military preparations. Their Commissariat Department has been actively employed within the last few days in killing and salting all Debartsch's cows. This is actually the case.

"The British inhabitants of the City are arming and drilling, and talking and swaggering after the most approved fashion. I really wish they would drop a little of the Bobadil. Modesty is the most graceful plume to the helm of valour. I dare say they will fight well enough, but they brag most unconscionably. The City was never more tranquil than at this moment. Papineau and a few other such vultures, against whom warrants of arrest for high treason have been issued, are off."

Two days after this last letter was written, Col. Gore was sent against the rebels posted at St. Denis. He was accompanied by 200 infantry, some volunteer cavalry, and three guns. At the same time Lt.-Col. Wetherell was ordered to proceed against St. Charles (otherwise known as Debartsch). The repulse of the troops at St. Denis on November 23rd, Wetherell's victory at St. Charles on the 25th, and the brutal murder of Lieut. Weir, who was captured by Dr. Nelson, the rebel commander at St. Denis, are events too well known to call for more than a mere reference to them.

Writing from Montreal on Dec. 1st, Mr. Coffin thus speaks of these thrilling incidents:

"Markham," (*i.e.*, a captain of the 32nd who was in command of the skirmishing party at St. Denis, and who had received four wounds), "is doing very well. Fancy his men, when landed from Sorel without shoes to their feet and altogether as war-worn as if they had retreated from Moscow, breaking from their ranks and rushing up to his lodgings to ask how he was doing, and when assured of his convalescence, cheering and dancing about like so many Bedlamites. I have been told that the scene was one of the most affecting ever witnessed. Of poor Weir it is painful to write. All that we have since heard confirms the first distressing intelligence. Nothing absolutely decisive is yet known, but of the fact of his murder there can be but little doubt. And yet I will undertake that a far louder feeling is displayed on his account at a distance than here. Here, as in the time of the cholera, and in all times of public peril, self

absorbs every other nobler sentiment. Every man appears absorbed in one consideration--the worthier, how he shall fight; the more sordid, how he shall run. . . . Poor amiable kind-hearted Weir, by whose side I sat at dinner hardly ten days since! His fate demands a hecatomb and it will be sternly exacted. Eight companies marched yesterday for St. Denis from Sorel, the Light Company of the 32nd (Markham's and Weir's) among them; the men are awfully savage. I doubt if a trace of that murderous den will be left. So much for civil war. Woe be to those who have brought its horrors upon this hitherto peaceful land.

"Simultaneously with the departure of this detachment returned Col. Wetherell and his Royals with their two guns and thirty prisoners. They were received by an immense concourse of people and with the greatest enthusiasm. They brought with them the standard of revolt—a pole surmounted by a *bonnet rouge* with a gilt tassel and surrounded with a humble imitation of the Roman fasces. Ovide Perrault, of Montreal, Advocate, is the only man of note known to have fallen. At St. Charles about one hundred were slain—more may have fallen and their bodies have been burned in the houses which were destroyed.

"This District is in a lamentable state. The County of Two Mountains is quite in a state of insurrection. Hitherto these gallant patriots have done nothing but menace and expel the old country people from among them at the point of the bayonet. We have numbers flocking into town for protection who have been despoiled of their cattle and other moveables, and wantonly driven from their humble yet happy homes to beg their winter's bread in this city. Everything has been done and will be done for them that is practicable. A man at St. Johns, a loyal Canadian volunteer, was found in a field near that place yesterday with three musket balls through his body. He had been murdered by some of the St. Athanase Patriots. MM. Peltier and Cherrier, have been this day accommodated with apartments at the Queen's expense on charges of High Treason. At Quebec as well as here the volunteers are very busy and I understand getting on admirably. The townships are also arming, and all the back English settlements to which munitions of war can be conveyed without interruption have been amply provided. I think before they have done the French leaders will find themselves in a hornet's nest. The 43rd is on its way to Quebec by the Post Route. We expect daily to hear of their arrival and I suppose we shall have ten thousand men out in the spring, until when it will be strange indeed if we cannot keep the province."

A letter of December 9th gives us interesting information concerning the aid which the rebels expected from the Americans, also concerning the vigorous measures adopted by the Government.

"Things here brighten up extemporaneously and people's faces glisten proportionately, to be clouded *per contra* on the following day. The worst intelligence we have is of the unnatural though not unaccountable sympathy which is getting up on the other side of the lines. This is an evil without immediate remedy among a people who may be doubly influenced to act against us—part from the most honourable feelings, but the plupart from mercenary motives. The rebel recruiters on the lines offer eight dollars per month as the wages of their treasonable iniquity and 200 acres of land when the war is over and the British banner expelled from the American soil by the "*triumphant generals of the Republic.*" . . .

"But you want facts, not speculations. The first therefore is as cheering a one to us as it has proved ominous of the future fate of similar Yankee enterprises. A party

of the rebels had purchased two brass three-pounders in the States and attempted by the assistance of some of their American recruits to bring them into the Province. The Militia however of Missisquoi Bay who had made application for arms to the Commander of the Forces, fortunately received them about an hour before intelligence reached them of the advance of the rebel detachment. With a zeal and promptitude altogether unexpected and which reflects the greatest honour upon them, they absolutely broke open the arm chests and ammunition kegs, rushed quite "promiscuously" to the spot where the rebels were—attacked them—killed five—wounded more—took some prisoners and captured the guns—bravo for the Yankees on our side of the lines!

"Poor Weir was buried yesterday with military honours, the whole population (British) having turned out to attend him to the place of interment. I never witnessed such a sight before. I suppose there were 3000 men under arms. Considering that they have been only three weeks under drill you would be astonished at the soldier-like appearance of some of the volunteer corps. It must have been an imposing and alarming spectacle to Jean Baptiste. I cannot write to you about poor Weir—the details of his fate are too horrible for your eye. I will, if I can find time to-morrow, give Dr. Sampson some account of it and other things. You have undoubtedly heard that the second expedition to St. Denis reached St. Hyacinthe and returned without having encountered any opposition. Poor Weir's remains were found at St. Denis. A proclamation will appear this morning offering £500 reward for the apprehension of his murderers.

"Martial law is declared. When we have time we shall give the rebels upon the Ottawa some proof of its efficacy. They are safe in a bag and can keep till wanted."

"The rebels upon the Ottawa" had not to wait very long. On the 13th Dec., Sir John Colborne marched against them with about 2000 regulars and militia, crossed the Ottawa on the ice, and directed his course towards the village of St. Eustache, where about 1000 patriots had assembled. Mr. Coffin accompanied the troops in the capacity of interpreter to Col. Maitland, and he was therefore an eye-witness of the battle of St. Eustache. His vivid description of the fight, was written to his young cousin Miss Grant. It is one of the most interesting letters in the packet, but unhappily is too long to be quoted in its entirety.

"You must know that as I was acting interpreter to Col. Maitland, I was with the leading files and had consequently the best opportunity of seeing everything, and perhaps the most brilliant sight I ever beheld was the first opening of our artillery upon the rebels as we advanced upon St. Eustache. We ascended the bank of the river; about two miles below the village we suddenly heard and saw the smoke of musketry in the woods on the opposite shore. This we knew arose from Globenski's corps of volunteers which had been detached through the bush in that direction to intercept any fugitives from St. Eustache across the ice. The rebels had anticipated them, and at a sharp bend in the river we suddenly came in sight of two columns of patriots, say about three hundred men each, crossing the river under the impression (as it ultimately proved) that the main body of the troops was advancing in that direction. Sir John was at that moment with the advance, he instantly ordered up the guns, at a moment the ranks opened out right and left and two or three pieces rattled up, unlimbered, and opened like light upon the gentlemen in *mufti* who were slowly wending their serpen-

tine way across the ice at about the distance of a mile. You may fancy the *tableau* at the moment. The day was one of the calmest and brightest of a Canadian winter. The whole scene bore that still and peaceful character peculiar to the Canadian landscape at this season of the year. . . . In a moment all is animation and excitement. Words of command thunder along the line—the men roused from the plodding quietude of the march are loading and priming and bayonetting—a reawakened volcano—orderlies are dashing here, aides-de-camps there, and dragoons everywhere. Sir John and his immediate staff, looking like so many military cucumbers, are reconnoitering through their telescopes in front, while up come the guns, the artillery drivers lashing and swearing, and the horses doing all they ought not to do, until a couple of pieces are brought to bear, and then the thunder of their reports and the whistling rush of the balls, and the reiterated commands discourse sweet music after the school of Charles XII. . . .

"I had just returned through a street, the lower part of which in conjunction with the Church Presbytery and nunnery was one mass of living flame. Every here and there lay the body of some unhappy rebel stretched out upon the snow, with a small group of five or six idlers standing round each, while the deep glow of the conflagration brought into startling relief the livid features of the dead and the wondering countenances of the living. Here and there were groups of artillery removing their guns—soldiers searching for their billets—irregulars laden with plunder of the most incongruous description—horses that had broken loose rushing wildly here—tumbrils hurrying up from the vicinity of the flames in another direction—and then the din—the shouts—the wild laughter—the enquiries—the orders—and above all the deep diapason of the devouring fire. . . .

"The first detachment of the 43rd has reached Quebec. Pearson is not with it. The rest will be up soon. All the world is in glorious spirits and nobody seems to care a fig for the past or the future. Nothing but gaiety is in anticipation; how I should laugh at the change a Yankee invasion would effect! . . . You must not suppose that I have altogether lost sight of your late perils and present disquietude. I do not think you have any serious cause for alarm. Yet I cannot help thinking that Sir Francis has more on his hands than he bargained for. Navy Island and the Buffaloes never I *guess* came into his *calculation*. He has been taken by surprise not a little. I don't imagine he will be quite so ready to despatch *all* his troops on a future occasion. You will have the remainder of the 24th up by the same post with this letter. . . ."

After the battle of St. Eustache, the various districts lately so disaffected, made loud protestations of their loyalty. Having arrested some of the ring-leaders of the revolt, Sir John Colborne, deeming the country sufficiently pacified, returned to Montreal on the 19th December.

Meanwhile Lord Gosford had been pressing his resignation upon the Home Government. This was accepted about the beginning of the new year, but owing to illness his Excellency did not leave Quebec till near the end of February. Sir Francis Head followed him very shortly.

On January 14th Mr. Coffin writes:

"Our latest intelligence here from London confirms a very unexpected and, at this moment, unfortunate occurrence. Col. Sir George Arthur is appointed to succeed Sir F. B. Head as Governor of Upper Canada with the rank of Brigadier General. The

Ministry has acceeded to the request of Lord Gosford for his recall, but his successor has not yet been named. The circumstance of the latter individual not being known in London induces me to credit the rumor that Sir John Colborne is the man."

On Sunday, February 25th, he writes:

"Lord Gosford we are assured will leave Quebec on Tuesday. I am told that he is looking very ill, and to tell you the plain truth I have my doubts if he can quit on this day. His remaining here, powerless himself and disqualifying others, is an incalculable evil. The crowning absurdity of his administration has been the proclamation of a general thanksgiving. It is tantamount to the repeal of Martial Law in this district —has been already adverted to in that point of view by the Chief Justice of the Court of King's Bench in his charge to the Grand Jury of this district. Conceive the anomaly of the very soldiers who are ordered to go to church and return thanks for the profound peace and tranquillity which has been restored to this province, being at the same time under orders to be continually ready at an hour's notice to march for the purpose of repelling invasion or suppressing insurrection. But the malignity of the evil is not yet felt."

Mr. Coffin was so far correct in his surmises that Sir John Colborne was appointed to administer the Government temporarily until a successor to Lord Gosford could be named.

The references in these letters to the troubles of Upper Canada at this time are not numerous, but in the last letter I have quoted from, Mr. Coffin speaks of one of the foolish plans projected by the misguided Mackenzie after he had taken refuge on American soil. Early in February, 1838, he designed attacks on Canada at four different points, Detroit, Sandusky, Vermont and Watertown, N. Y. The notorious Van Rensalaer and Bill Johnson assembled a force of about 2000 "patriots" at French Creek on the St. Lawrence, near Watertown, intending to attack Kingston, but the brave front made by the loyal militia overawed the enemy, and they gradually dispersed. However there was much alarm in Kingston.

About the time that the invasion of Kingston was expected Mr. Coffin was sent on an important mission to Albany.

"I must now relate to you the cause of my expedition to Albany and the matters and things which befell therefrom. I had the honour of being sent by Sir John Colborne in quest of Governor Marcy. . . . I went upon a Mission as nearly allied to diplomacy as the Canadian revolt is to the French revolution. But *badinage à part* Sir John treated me in that matter with a great deal of gratifying confidence and condescension. I was put in possession of all necessary facts—my letters were open and were rather those of introduction, and I was left personally to communicate what is generally contained in despatches. On my return I assumed the responsibility of conveying certain intelligence to General Wool, with whom I had a long and interesting interview, and I am happy to add that Sir John expressed himself satisfied, and that too in the kindest terms, with the manner in which I acquitted myself."

In this letter Mr. Coffin expresses his views as to the attitude of the Americans in a very pointed and concise manner.

"The upper classes in the state, the educated and the intelligent, are decidedly averse to a collision with England. The lower classes sympathize with the rebels, less because they love patriotism than because they envy and hate the British. A war has been hitherto averted by the personal influence of a few sensible men."

Early in February the Earl of Durham was appointed governor-in-chief and "Her Majesty's High Commissioner for the adjustment of certain important affairs affecting the Provinces of Upper and Lower Canada." At the same time an act was passed in the Imperial Parliament, suspending the constitution of Lower Canada, and establishing a "Special Council" to take the place of the two Houses of Parliament. This council was to be composed of equal numbers of French and English. From one of the letters before me, I learn that among the appointments made by Sir John Colborne to the Special Council was that of Mr. Coffin's brother Austin, who was "to represent the interests and the wishes of the emigrant population of the townships."

With what intense eagerness Lord Durham's arrival was awaited may be gathered from a letter of Mr. Coffin's, dated March 30th, 1838:

"I know not what to think of the new Avatar. When in Quebec I saw a letter from the Hon. A. W. Cochrane, now in London. He augurs favourably of Lord Durham, and all the world here seems inclined to chime to the same tune. One thing is certain, he is the arbiter of the destinies of the people of these Provinces, and be it for good or be it for evil, I tremble to think how momentous a trust has been confided to the wisdom or to the caprice of an aristocratic Whig Lord, and a man who will pull down the high if he can, and keep down the low if he dares. From the sensation which Canadian affairs have created in England, and the ostentatious tuition his Lordship is now undergoing at the Colonial Office, (so many hours *per diem* the newspapers say) and his evident and most laudable desire to establish a noble reputation as pacificator of Canada, I fear that he may overdo the thing, that he may come out here with an exaggerated and Quixotic idea of the stern justice it is his duty to dispense, and in his anxiety to play the part of a Minos, confound the tried British loyalists with the *soi-disant* loyalists of Canadian extraction. . . .

"There is an *Association Canadienne* on foot here headed by a few respectable names—by a few of the heads of the old and first Canadian families who with a short-sighted anxiety to protract the existence of '*notre langue, notre religion, et nos lois*,' represent the mass of the French Canadian people—the whole district of Quebec, and Three Rivers and a vast majority of the district of Montreal, as perfectly loyal, and then ask, Are we to be disfranchised? Are we to be punished for the faults of a few?"

A letter dated Quebec, June 2nd, makes reference to the outrage perpetrated on May 29th in Upper Canada by a band of fifty rebels under Bill Johnson, who before daybreak boarded the steamboat Sir Robert Peel, while taking in wood at Well's Island, on the American side of the St. Lawrence. Though the weather was cold and stormy, the passengers

and crew were forced to leave the vessel, which was pillaged and burnt.

Mr. Coffin writes:

"What an atrocious outrage! I was inconceivably shocked to hear that Mrs. Sampson and party had been exposed to the violence of these ruffians. I fear their loss in property must have been great, independent of the terror and cruel exposure to which they were subjected. The excitement throughout the loyal portion of the people here was intense, and is still so; it is easy, therefore, to imagine what it must be with you. I trust, however, most earnestly, that no serious attempt at retaliation will be made now in cold blood."

Lord Durham landed in Quebec, amid great pomp, on the very day of the Sir Robert Peel outrage. Mr. Coffin thus describes the new Governor:

"He barks loud and by the teeth he shows I think that (reversing the old proverb) 'his bite is waur than his bark.' This man Lord Durham is a smasher—he will make or break whatever he takes in hand—and one trait in the fellow I like, for good or for evil he wants no man to share the responsibility with him. This is a hasty opinion of a man who has been hardly ten days in the country, but it agrees with my preconceptions and is confirmed by the decision of character he has already displayed. His court, establishment, staff, etc., is of a very splendid description, and I really think, from his personal appearance and, where appropriate, from his courteous demeanor, that this display arises as much from policy as from natural taste for the magnificent. As policy it is undoubtedly good all the world over, but most especially in Lower Canada. The relicts of the patriot party, and this place is still plentifully bespatted with them, are evidently awestruck, nor is this feeling confined to them alone."

An incident that well illustrates the character of this aristocratic Whig Lord is recorded in a letter bearing the date of June 23rd, 1838, and written from Montreal.

"We are expecting daily to receive some definitive instructions respecting the future fate of the prisoners. What that may be John George Earl of D. only knows. I have, however, great misgivings. The Governor-General is to be here himself in the beginning of July. The fact is that the good people of Montreal are not more intractable than their neighbours. Through the Press they assailed his Lordship upon his arrival, whereupon the Vice-regal Earl countermanded the preparations which were then making for his reception here, and openly declared that he had intended spending £20,000 in Montreal, by which sum Quebec would be the richer. Whereupon the good City of Montreal fell upon her marrow-bones and cried '*peccavi*' in no time. A meeting was held incontinently, resolutions passed, and his Excellency declared to be the *ne plus ultra* of a nobleman, a Governor, an ambassador, *sapiens ne etiam et* . . . However that may be, his Lordship is to be here on his way to Upper Canada, and although he has expressed a determination to live on board of the steamboat that conveys him up, still it is hoped that he may condescend to cast the light of his golden countenance on the intelligent, independent, and disinterested population of the City of Montreal. I like this same John George for the dare-devil, don't-care-a-fig sort of way in which he carries on the war. He hired the John Bull as his private travelling carriage,—one of her boilers, however, got out of order, so that he is compelled to put up with a steam frigate. To make amends he has bespoke the River Saint Lawrence

for his journey. Any man presuming to travel on it the same day is to be excommunicated forthwith. The very fishes have been ordered to retire to their holes at his august passover."

One of the first questions which Lord Durham had to deal with was the fate of the numerous political prisoners. A formal trial by jury was thought unsatisfactory, Frenchmen being likely to acquit and Englishmen to condemn, through sheer national sympathy or antipathy. Lord Durham adopted a policy which gave general satisfaction here, but aroused great hostility at home. Having induced some of the imprisoned ring-leaders to confess complicity in rebellion, the Governor-in-council pardoned minor offenders, but banished the principal ones to Bermuda under penalty of death should they return, the same punishment being threatened Papineau and others in the event of their setting foot again in Canada. This decision was proclaimed on the 28th of June, the day fixed for the Queen's coronation.

In the British House of Lords, the actions of the Governor excited indignation among his political enemies. Lord Lyndhurst declared that no such act of despotism had ever been hazarded in any country that respected legal forms. Lord Brougham and the Duke of Wellington also denounced the Indemnity ordinance, and the Ministry yielding to the criticism allowed a vote of censure upon Lord Durham to be carried. The Earl at once sent in his resignation and returned to England without even waiting for his recall.

These events aroused astonishment and indignation among British Canadians. Mr. Coffin writes from Quebec on September 23rd:

"What think you of the last intelligence from England? Can you conceive anything more ungenerous or discreditable to British legislation than the whole course of conduct adopted towards the Earl of Durham? and that such suicidal measures should emanate from the House of Lords! The long record of political blundering which constitutes the history of British North America presents no act more shameful to the parties principally concerned, more humiliating to England herself, or more ominous to these Colonies, than the nullification of these ordinances by a pusillanimous Ministry. Lord Durham goes home at once. He expressed that determination in his reply to the address of the Deputies from the Lower Provinces whom he has dismissed. The Malabar 74 is under orders to convey him and his family to England by the 6th of next month. It is almost incredible, yet not the less true, that the Earl of Durham received letters from Her Majesty and from Lords Melbourne and Glenelg, expressive of their satisfaction of these obnoxious ordinances and of his general administration of the Government, dated the very day on which the debate took place in which they were so factiously assailed and he so disgracefully abandoned. I will not trouble you here with the state of feeling in Quebec, but refer you to an article which will appear in the *Montreal Gazette* of Tuesday next, signed "an Englishman." I need not reiterate here what will, at all events, be easier to read in print than in hieroglyphics."

Sir John Colborne again became Administrator of the Government.

From a letter of Mr. Coffin's we learn that soon after Lord Durham's arrival, Sir John Colborne decided to retire from Canada. He writes on June 23rd:

"Sir John Colborne has determined on demanding his recall. John George fancies himself General in every sense of the word, and I can easily understand that any interference on his part would be intolerable to Sir John. To say the truth as far as Sir John is concerned, I cannot regret his decision. He requires rest, and every such man ought to retire on his laurels before they fade. Health and happiness be with him wherever he goes!"

As Administrator and Commander of the Forces Sir John Colborne had his hands full. The very evening of the day Lord Durham sailed from Quebec, rebellion broke out afresh, the first act of hostility being the seizure by about 400 men of the steamer Henry Brougham at Beauharnois, on the St. Lawrence. Dr. Robert Nelson established himself at Napierville, issued a Declaration of Independence, and proclaimed himself Provisional President of the Republic of Lower Canada. He was in command of a large number of American mercenaries, and was soon joined by many Canadians, his force aggregating some 2000 persons.

But such prompt and effective measures were taken by Sir John and the loyal militia that within one week after its outbreak this second rebellion was suppressed.

Most unhappy were the consequences of this foolish rising. Courts-martial were organized, many prisoners were sentenced to transportation, while twelve were condemned to death and afterwards executed.

But worse than this was the misery caused by the avenging zeal of extreme loyalists who burned and plundered freely in the disaffected districts. Quoting from the Montreal Herald, Garneau tells us that "On Sunday night the whole country behind Laprairie presented a frightful spectacle, being one sheet of livid flames; and it is said that not one rebel's house has been left standing. God knows what is to become of the Canadians who have not perished, their wives and their families, during the coming winter, seeing that they have nought in prospect but the horrors of hunger and cold."

In a long and very interesting letter of July 9th written from St. Denis, Mr. Coffin gives us a very different and happier picture of the Eastern Townships, as lately seen by him when making an excursion on horse-back from St. Denis to Lennoxville, and thence to Port St. Francis. He says:

"I was anxious to judge for myself as to the actual state of the rural population of this District. I rode therefore, and having fifty occasions per diem to pull up and chat, or dismount and enter into the houses of the people as I passed along, I think

I have been enabled to form a pretty accurate opinion as to the present state of feeling throughout the parishes I visited. I passed through those of Varennes, Vercheres, St. Denis, St. Charles, La Presentation, St. Hyacinthe and St. Pie, generally considered as the most disaffected in this disaffected district, and subsequently through the French country in the District of Three Rivers from Drummondville to Port St. Francis. I found universally the same olden civility and good nature, the same quiet and pastoral appearance which characterized this contradictory peasantry previous to the revolt. This visitation has left few traces of its progress, and those few are of a nature to disappear rapidly. Houses and barns are building and repairing, agriculture proceeds in the customary routine, pot herbs flourish with the usual exuberance in every little garden, and flowers adorn and humanize every cottage window. . . ."

How to manage these amiable *habitants* is a problem upon which Mr. Coffin has an opinion to offer:

"Now the only way to control a people so easily misled is to coerce the misleaders. . . . Substitute for these dangerous chatterboxes men who, understanding the language and the habits of these people, will go and reside among them, will identify themselves with them, will talk with them by their own firesides, administer summary justice for them at their doors, who may worthily represent a Government hitherto misrepresented or unknown, and explain the objects, the rules and the advantages of institutions whose benefits they thus practically diffuse. This is my view of the thing, and, I may add, in that of Sir John Colborne, is the intention and duty of the Stipendiary Magistracy just now introduced into this province. In discharging this duty they must naturally observe all that is going on in the country parts and will report accordingly, but their first labour is a labour of peace and reconciliation."

In another part he adds,

"The majority of these people is, I believe, loyal, but there is also a large and dangerous minority who desire a change and who are encouraged in their hopes and wishes by their proximity to the Frontier. The latter will cause trouble yet, if not well looked to. Not but that I am convinced that it is in the power of the Government to make itself so beneficially felt in this as well as in the French country and to win back the reasoning and reasonable portion of these recusants from their political heresies. Feeling convinced, as I conscientiously do, that our system of government is practically the best in the world, if properly administered and brought home to the governed, I am equally sure that if it fails in its effect it will be the fault of those who dispense it."

English as he was, Mr. Coffin could not but warmly admire the French as contrasted with his own fellow-countrymen.

"You cannot help remarking in this country the striking contrast which exists in the manners of the two races. Among the French all its politeness, hospitality, good will, deference. This is a stiff-necked, unbending and apparently most unamiable generation. Here, as in their fatherland before them

> That independence Britons prize too high
> Keeps man from man and breaks the social tie.

And, yet, in the main, when you know how to take them, they are good fellows enough."

At the request of Sir John Colborne, Mr. Coffin gave up his position as Assistant Civil Secretary, and accepted that of Stipendiary Magistrate in what had been one of the most disquieted districts. His reception by the people was not a kindly one, and his success in restoring good feeling was not as great as in his generous enthusiasm he had expected it would be.

Writing from Sainte Marie de Monnoir, Sept. 23rd, he gives us the following account:

"I was on the point of being stationed at Belœil, in the centre of your rebellious *Censitaires*, when it was unfortunately discovered that Sainte Marie was a more disagreeable and a more turbulent place, and I was sent there forthwith, as I sometimes flatter myself, into honorable banishment like Lord Bloomfield to Stockholm. This extensive and populous seigniory is unquestionably most disaffected. To you who are acquainted with the habits and character of the Canadian peasantry, one trait alone will suffice. Not one man in twenty will salute me, or offer the slightest mark of recognition or respect. Most of them look very sulky, and many will not even look at all. Now this speaks volumes. Still I do not despair. I have only just begun. The country has been without law or justice or even the appearance thereof, except in very heinous cases, for years, and even in them justice was administered at such a distance, that practically the people have known nothing of its operation or of its effect. . . . I have made the Police and the Magistracy respected, I believe feared, hereabouts, but I doubt if my authority is popular. This is, however, a matter about which I care little just now. I hope that time will produce the natural good results of justice united with firmness and kindness wherever it can be beneficially exercised."

Lord Durham had remained in this country only five months, yet in that short time he had examined very thoroughly into the causes of discontent, and his report sent in on his return to England is one of the most valuable and statesmanlike documents ever presented on Colonial affairs. "In each and every Province," he wrote, "the representatives were in hostility to the policy of the Government, and the administration of public affairs was permanently in the hands of a Ministry not in harmony with the popular branch of the Legislature."

The principal recommendations made by Lord Durham were a Federation of all the Provinces, an intercolonial railway, and an Executive Council responsible to the Assembly. Failing a complete Federation, the immediate union of Upper and Lower Canada was strongly urged.

The report was vigorously condemned by the members of the Family Compact in Upper Canada, but for the most part was received with warm approval. Mr. Coffin's views are given in a letter dated April 17th, 1839:

"I do not suppose that you have plunged very deeply into this document of the abdicated Autocrat. My attention has, of course, been chiefly directed to his view of the affairs and present condition of the Lower Province, with which in the main I am much pleased. He has separated the real from the ostensible cause of quarrel and

has developed fairly and very lucidly the national character of the controversy. His report on the Upper Province is generally denounced here as a distortion or misrepresentation of facts and therefore, of course, replete with false inferences; and there is a flippant superficiality in its style which contrasts strongly and very disadvantageously with the account of Lower Canada—the two productions are evidently from very different pens.

"From what we can learn, they have resolved at home upon a legislative regeneration of the Canadas of which "A Union" is to be the basis. I doubt the efficacy of the proposed panacea if the maintenance of the British connection is the real and honest object of the Ministers—if there is no republican *arrière pensée*—no paving of the declivity of revolution—of which I am sure there is a great deal. And even then, however dishonest and deceitful the policy, a statesmanlike view of the same end would rather have aimed at it through a Legislative Union of the whole British North American Provinces. Admitting the impossibility or inexpediency of maintaining the connection between us and the Mother Country, and that all parties acquiesced in the necessity of a separation, I should say (private feelings apart) that the true policy of England, her interest and her duty would be to unite her American Provinces, elevate them collectively to the rank of an independent people—create an antagonistic Republic on the North American Continent, and make the United Provinces redress the preponderance of the United States. Institutions of a republican character would bribe the disaffected and discontented, while the legislative form of general government aided by such additional restrictions as Great Britain, in conferring a constitution, might very easily impose, would ensure such strength to the executive and consequent security to property as can never be expected under the jealous limitations and circumscribed power of a Federative Constitution. Such a republic established in these colonies under the immediate protection of Great Britain, receiving from her all the benefits they at present derive and returning the same — relieving her from the expense of garrisoning and governing and yet acting as an outlet for her superabundant population and increasing manufactures, would, *the necessity of such separation once satisfactorily established*, possibly prove as good a scheme as any—certainly better, immeasureably better than a simple Union of Upper and Lower Canada."

In 1839 the British Government, having determined upon the advisability of uniting the two Canadas, sent out as Governor General the Right Hon. Charles Poulett Thompson (afterwards Baron Sydenham & Toronto), a noted merchant, who was in 1834 President of the Board of Trade. Owing to his connection with the Baltic timber business, he was at first regarded with suspicion in Canada, but shortly became very popular. Says Mr. Coffin, writing from his retreat at Sainte Marie (Sept. 23rd, 1839).

"That Poulett Thompson, the avowed enemy of the Canadian merchant, should be the man, would be incredible, if any extravagant or incomprehensible project in her Majesty's Ministers could be a just ground for incredulity. I would almost wager that if he does come out, Sir John Colborne will return to Canada. In the course of a few months confusion will be thrice confounded. Poulett Thompson will follow the herd of incapables that has preceeded him, and ministers on their marrow-bones will pray Sir John to return to save them—if he can."

And again a few weeks later:

"I shall very probably part company from H. M. Ship Government, and return to my profession in the spring. She appears to be a crazy craft, very insufficiently manned, and as for the Skipper, the manner in which 'greatness' has been 'thrust upon him' only completes the 'midsummer madness' of the whole expedition."

Mr. Coffin, however, had reason shortly to change his opinion of Lord Sydenham. The new Governor proved to be a man of great ability, and Mr. Coffin acted under him in a number of important Commissions.

But at the time of Lord Sydenham's appointment, Mr. Coffin could not but think that the Home Government was slighting Sir John Colborne, for whom he had the highest and most affectionate regard. Writing to Mrs. Grant, he says:

"Sir John is really going, and for his sake I am sincerely glad of it. Considering the intricate game he has had to play, his political career in this Province has been most felicitous. His military is beyond praise. He returns universally respected and regretted, even by the Canadian population. He has worthily won his laurels; long may he live to enjoy them. I cannot help thinking that her Majesty's Government will award him on his return home with something more substantial and permanent than expressions of thanks.

"I suspect much that the restoration of Judges Panet and Bedard and the release of Viger from prison, are among the chief reasons for relieving Sir John. I've a notion that the uncompromising veteran will not yield his point, that Ministers know it or conjecture as much, and anticipate this obstacle to their wishes by providing at once a convenient successor."

And writing three days after Lord Sydenham assumed the Government, he says:

"In Sir John we have lost an exemplary man—a laborious and practical Governor, and a soldier experienced in the peculiar warfare of harassment and alarm, more than actual incursion, to which these Provinces have been and still are exposed. The existence of a man so singularly and peculiarly qualified to preside over the Government of these Provinces at this crisis, appears almost to have been a special interposition of Providence, while the blind and senseless manner in which it has been rejected and despised, argues equally the truth of the saying, 'that Providence stultifies those it intends to destroy.'"

Here follows an account of Mr. Coffin's parting with the chief he loved so well, an account I cannot forbear from quoting, even if it reveals some slight measure of personal vanity in the writer:

"I took leave of him about a week since. He was very kind and warm in his expressions of personal kindness and remembrance. My parting with him was attended by circumstances of peculiar gratification to me. They afforded me a glorious triumph over those cubs arround me, who envious of the confidence he openly reposed in me, had caballed so successfully as to induce me to resign my first appointment. When the time for his departure arrived, he found business throng upon him which these fellows were incompetent to perform. He sent for me and kept me in town a week,

busily employed night and day, with him continually in his usual friendly and confidential manner, until I had got the work done for him which these gentry could not do. I could see that it was gall and wormwood to them, the hounds! while I, the while, was unimaginably silky and buttery, and as soft and soothing in all my doings as the boiled pease in the shoes of the knowing Pilgrim to Compostella. I cannot help thinking from Sir John's manner that he expected me to ask him for something, possibly to push my interests with the new *Gub*, but I was determined to show him that a loyal Englishman could serve him disinterestedly, and I could have done ten times more than I did do from sheer love for the gallant old man—God bless him—without hope of favor or reward."

Sir John Colborne did receive, on his return home, "something more substantial and permanent than expressions of thanks."

He was almost immediately created Baron, Lord Seaton, and shortly afterwards was further honoured by being appointed Governor of the Ionian Islands. During his tenure of this office, he carried through many important legislative reforms. In 1860, on his return to England, he became a Field Marshal of the Empire.

THE PHOCAS OF TERRE NEUVE.

By Rev. Philip Tocque, A.M.

(Read 2nd April, 1892.)

Naturalists describe no less than 15 species of seals. The kind most plentiful and which pass along the coast of Newfoundland with the field ice, are the *Phoca greenlandica*, which is the technical or scientific name given to the harp or half-moon seal, which frequents the coast of Terre Neuve or Newfoundland. About the last of the month of February these seals whelp, and in the northern seas deposit millions of their young on the glassy surface of the frozen deep. At this period they are covered with a coat of white fur, slightly tinged with yellow. I have seen these "white coats" lying six and eight on a piece of ice, resembling so many lambs enjoying the solar rays. They grow very rapidly, and about three weeks after their birth begin to cast their white coat. They are now captured, being killed by a stroke across the head with a bat, gaff or boat-hook. At this time they are in prime condition, the fat being in greater quantity and containing purer oil than at a later period of their growth. It appears to be necessary to their existence that they should pass a considerable time in repose on the ice; and during this state of helplessness we see the goodness of Providence in providing these amphibious creatures with a thick coat of fur, and a superabundant supply of fat as a defense from the intense cold of the ice and the northern blasts. Sometimes, however, numbers of them are found frozen in the ice. When one year old these seals are called "bedlamers." The female is without the dark spots on the back, which form the harp or half moon, and the male does not show this mark until two years old. The voice of the seal resembles that of the dog, and when a vessel is in the midst of myraids of these creatures, their barking and howling sounds like that of so many dogs, literally driving away sleep during the night. The general appearance of the seal is not unlike that of a dog, whence some have called it the sea dog, sea wolf, etc. These seals seldom bring forth more than one, and never more than two, at a litter. They are said to live to a great age. Sometimes a stray one is caught in a net, reduced to a mere skeleton, with teeth all gone, which is attributed to old age. Buffon, the great French naturalist, says: "The time that intervenes between their birth and their full growth being many years, they, of course must live very long. I am of opinion that these animals live upwards of a

century, for we know that cetaceous animals in general live longer than quadrupeds; and, as the seal fills up the chasm between the one and the other, it must participate of the nature of the former, and consequently live much longer than the latter." The Newfoundland seals probably visit the Irish coat. A number of seals were killed on the west coast of Ireland in 1856, among them the old harp, and Sir William Logan gives an account of the skeleton of this kind of seal having been found embedded in the clay around Montreal 40 feet deep.

The *Phoca cristata*, or hooded seals, are so called from a piece of loose skin on the head, which can be inflated at pleasure. When menaced or attacked the hood is drawn over the face and eyes as a defense. The female is not provided with a hood. An old dog-hood is a very formidable animal. The male and female are generally found together, and if the female happens to be killed first, the male becomes furious. Sometimes 10 or a dozen men have peen engaged upwards of an hour in despatching one of them. I have known a half a dozen hand-spikes to be broken in endeavoring to kill one of these dog-hoods. They frequently attack their assailants, and snap off the handles of the gaffs as if they were cabbage stalks. When they inflate their hoods it is very difficult to kill them. Shot does not penetrate the hood, and unless the animal can be hit somewhere about the side of the head it is almost a hopeless case to attempt to kill him. They are very large, some of their pelts which I have measured being from 14 to 18 feet in length. The young hoods are called "blue backs." Their fat is not so thick nor so pure as that of the harps, but their skins are of greater value. They slso breed further to the north than the harps and are generally found in great numbers on the outer edge of the ice. They are said not to be so plentiful and to cast their young a few weeks later than the harps.

The harbour seal *Phoca vitulina* frequents the harbors of Newfoundland summer and winter. Numbers are taken during the winter in seal nets.

The square flipper, which is perhaps the great seal of Greenland *Phoca barbata*, is now seldom seen.

The walrus *Trichecus rosmarus*, sometimes called the sea horse or sea cow is now seldom met with. Formerly this species of seal was frequently captured on the ice. This animal resembles the seal in its body and limbs, though different in the form of its head, which is armed with two tusks, sometimes 24 inches long, consisting of coarse ivory; in this respect much like an elephant. The under jaw is not provided with any cutting or canine teeth, and is compressed to afford room for the tusks, projecting downwards from the upper jaw. It is a very large

animal, sometimes measuring 20 feet long, and weighing from 500 to 1,000 pounds. Its skin is said to be an inch thick, and covered with short yellowish brown hairs. What is called the seal is the skin with the fat or blubber attached, the carcase being left on the ice where it is killed. The flesh of the seal is frequently eaten, the heart and kidneys are like the pig's, and taste like them. The first thing that occurs in Newfoundland to break the winter's torpor is the bustle and activity attending the outfitting of the vessels for the seal fishery. In its prosecution are combined a spirit of commercial enterprise, a daring hardihood and intrepidity almost without parallel. The interest of every individual, from the richest to the poorest, is interwoven with it—from the bustling and enterprising merchant that, with spy-glass in hand, paces his wharf, sweeping ever and anon the distant horizon for the first view of his returning ship, to the little broom girl that creeps along the street, hawking her humble commodity. The return of the seal hunters reminds one of Southey's poems, "Madoc" and "Roderick the last of the Goths."

The seal fishery of Newfoundland has assumed a degree of importance far surpassing the most sanguine expectations of those who first embarked in the enterprise, and has now become one of the greatest sources of wealth to the country. In the commencement the seal fishery was prosecuted in large boats, which sailed about the middle of April and as its importance began to be developed, schooners of from 30 to 50 tons were employed, which sailed on the 17th of March. In 1845 the number of sailing vessels employed was 350, from 60 to 150 tons manned by 12,000 men. The time spent on the voyage was from two to six weeks. The sailing vessels have now been mostly superseded by steamers from 300 to 800 tons, carrying from 150 to 280 men each. In 1891, 19 steamers were engaged in the seal fishery. One steamer brought in 8,000 young harps the first trip and 18,000 old seals the second trip. The total value of both trips estimated at $132,000. Some of the steamers have brought in from 20,000 to 40,000 seals. A number of seals are taken in seal nets in winter and spring. A few years ago 150,000 seals were taken to the shore by persons who had walked on the ice in some of the northern bays of the island. Some years ago the ice was packed and jammed so tight in some of the bays for several weeks, that the seals on it could find no opening to go down, and numbers of them crawled upon an island, when some people happened to land upon the island and discovered them; 1,500 seals were slaughtered among the bushes. Seals have been known to crawl several miles over land. The number of seals taken yearly on the coast of Newfoundland is from 400,000 to 600,000, producing, commercially, no less a sum than $1,500,000. The seals are sold by weight. The young are sold at from

$4 to $6 and the old ones at from $4 to $5 per cwt. The price, however, is regulated by the value of the oil in the British market. A young seal will weigh from 30 to 50 pounds, and an old seal from 80 to 200 pounds. It is calculated that the fat of 80 young harp seals will produce a ton of oil. The seal fishery is a constant scene of bloodshed and slaughter. Here you behold a heap of seals writhing and crimsoning the ice with their blood, rolling from side to side in dying agony. There you see another lot, while the last spark of life is not yet extinguished, being stripped of their skins and fat, their writhings and heavings making the unpractised hand shrink with horror to touch them. The seal fishery being prosecuted during the vernal equinox is rendered particularly dangerous. It is a voyage of hopes and fears, trials and disappointments, and the prosecution of it causes more anxiety, excitement and solicitude than any other business in the island. Sometimes the seals are sought after at a distance of from two to four miles from the vessel, over huge rugged masses of ice, and during this toilsome journey the men have to jump from one pan of ice to another, across horrid chasms where yawns the dark blue water ready to engulf them. Sometimes "slob," or ice ground up by the action of the waves and covered with snow, is mistaken for hard ice, and the poor sealers leaping upon it are at once buried in the ocean. Not unfrequently, when the sealers are at a distance from the vessel in search of their prey, a freezing snowdrift or a thick fog comes on, when no object around can be descried, and the distant ship is lost. The bewildered sealers gather together. They try one course, then another, but in vain, no vessel appears. The lights shown from the vessel cannot be seen, the guns fired and horns blown cannot be heard. Night comes on, and the wretched sealers perish through fatigue, cold, and hunger on the glittering surface of the frozen deep. Scarcely a fishing season passes but the widow's wail and the orphan's cry tell of the dreary, the dreadful death of the seal hunters. Sometimes vessels are crushed between two large masses of ice called "rollers," when all on board are consigned to one common destruction. The islands of ice or icebergs, are dreadful engines of destruction. Many of these iron-bound ships come in contact with them, and sometimes vessel and crew perish together.

The Newfoundland seal is different from the Behring sea seal. The Newfoundland seal is what is called the hair or bearded seal. They are sought after for the value of their fat instead of their fur. The Newfoundland sealskins are worth not more than 50 or 60 cents apiece, whereas the fur seal, when dressed, is worth $60 a piece, in first hands. All the Newfoundland seals are whelped on the ice and not on the land as the fur seal.

CIRCULAR-LETTER ADDRESSED TO ASTRONOMERS OF ALL NATIONS.

PROPOSED CHANGE IN RECKONING THE ASTRONOMICAL DAY.

TORONTO, CANADA, 21st April, 1893.

The Canadian Institute in co-operation with The Astronomical and Physical Society of Toronto, have had under consideration the subject of Astronomical Time Reckoning, and have, after much deliberation and consultation, appointed a Joint Committee to suggest the best means of ascertaining the views of astronomers throughout the world.

The Joint Committee have presented the accompanying Report, in which both Societies concur.

On behalf of the two Societies we have the honour to direct attention to the observations and recommendations of the Joint Committee, as well as to the appended extracts, expressing the views of the following gentlemen :—

1. Sir John Herschell.
2. M. Otto Struvè, Imperial Astronomer, Pulkowa.
3. Mr. W. H M. Christie, Astronomer Royal, Greenwich.
4. Prof. S. Newcomb, Nautical Almanac Office, Washington.
5. Commodore Franklin, United States Naval Obs., Washington.
6. Mr. C. Carpmael, President Astronomical Society, Toronto.
7. Mr. Arthur Harvey, President Canadian Institute, Toronto.

In order to obtain the views of as many astronomers as possible the Joint Committee recommend that answers be invited to the following question :—

Is it desirable, all interests considered, that on and after the first day of January, 1901, the Astronomical Day should everywhere begin at Mean Midnight?

It is requested that early answers to this question be sent to the following address :—

JOINT COMMITTEE ASTRONOMICAL TIME,

CANADIAN INSTITUTE,

TORONTO, CANADA.

As it is intended to send copies of further papers on this subject to those replying, it is desirable that the full name, official designation, if any (professional or non-professional) and proper address be furnished with each reply.

ALAN MACDOUGALL,

G. E. LUMSDEN,

Joint Secretaries.

REPORT OF THE JOINT COMMITTEE

Of The Canadian Institute and The Astronomical and Physical Society of Toronto.

SANDFORD FLEMING, C.E., C.M.G., LL.D., Etc., *Chairman.*

Canadian Institute.	*Astronomical Society.*
ARTHUR HARVEY, President.	CHARLES CARPMAEL, M.A., F.R.A.S., Etc., President.
GEO. KENNEDY, M.A., LL.D.	JOHN A. PATERSON, M.A.
ALAN MACDOUGALL, C.E., Secretary.	G. E. LUMSDEN, Corresponding Secretary.

TORONTO April 20th, 1863.

Your Committee on the subject of Astronomical Time Reckoning, beg leave to report as follows :—

(*a*) That the Sixth Resolution of The Washington International Conference of 1884, which was carried unanimously by the representatives of the twenty-five nations there assembled, counting among them several astronomers of world-wide fame, reads as follows :—"The Conference expresses the hope that, as soon as may be practicable, the Astronomical and Nautical Days will be arranged everywhere to begin at Mean Midnight ;"

(*b*) If any action is to be taken on this Resolution, the most appropriate date for the new reckoning to take effect would be the first day of the new century ;

(*c*) As the Ephemerides are usually prepared four or five years in advance, it is obvious that if it be decided to make Astronomical Time accord with Civil Time at the date named, a common understanding should not be delayed beyond the year 1895 or 1896 ;

(*d*) To arrive at an agreement, it is considered essential to ascertain the views of those concerned ;

(*e*) The Canadian Institute and The Astronomical Society should, in the general interest, assume the duty of inviting opinions upon the subject, to be collated, tabulated and published in a special report ;

(*f*) If the weight of opinion expressed by those who respond to such invitation, be in favour of a change, further steps may be taken with the view of reaching an international understanding ;

(*g*) Your Committee suggest that the opinions which have already been expressed by some leading astronomers be published. To this end,

extracts from the writings of Herschell, Struvè, Christie, Newcomb and Franklin, are hereto appended; also, remarks recently made by the President of the Astronomical and Physical Society of Toronto, and the President of the Canadian Institute;

(*h*) Your Committee recommend that replies be asked to the following question, and that it be widely circulated:—

QUESTION.

Is it desirable, all interests considered, that on and after the first day of January, 1901, the Astronomical Day should everywhere begin at Mean Midnight?

(*i*) Your Committee further suggest that astronomers generally throughout the world be invited to send definite replies to the question as soon as convenient. Replies to be addressed, "*Joint Committee, Astronomical Time, Canadian Institute, Toronto, Canada.*"

Respectfully submitted,

SANDFORD FLEMING,
Chairman.

APPENDIX.

EXTRACTS FROM THE OPINIONS OF ASTRONOMERS AND OTHERS REFERRED TO BY THE JOINT COMMITTEE.

I. (935) Astronomical time reckons from noon of the current day; Civil, from the preceding midnight, so that the two dates co-incide only during the earlier half of the Astronomical and the later half of the Civil Day. This is an inconvenience which might be remedied by shifting the astronomical epoch to co-incidence with the civil. (147) . . . This usage has its advantages and disadvantages, but the latter seem to preponderate; and it would be well if, in consequence, it could be broken through and the Civil reckoning substituted. Uniformity in nomenclature and modes of reckoning in all matters relating to time, space, weight, measures, etc., is of such vast and paramount importance in every relation of life as to outweigh every consideration of technical convenience or custom. The only disadvantage to astronomers of using the Civil reckoning is this—that their observations being chiefly carried on during the night, the day of their date will, in this reckoning, always have to be changed at midnight, and the former and latter portions of every night's observations will belong to two differently numbered civil days of the month. There is no denying this to be an inconvenience. Habit, however, would alleviate it; and some inconveniences must be cheerfully submitted to by all who resolve to act on general principles. All other classes of men, whose occupations extend to the night as well as day, submit to it, and find their advantage in so doing.—*Sir John Herschell's Treatise on Astronomy.—Third Edition.*

II. Much earnest reflection, on the other hand, must be given to the desire expressed at the meeting, that Astronomical Time Reckoning should be brought in accord with the commencement of the day in civil life. In this matter, astronomers have not simply to abandon a custom of long standing, and consequently to make conditional changes of practice established for many years, but, at the same time, astronomical chronology is disturbed, which is easily understood, must exercise a marked effect on the comprehension of all problems bearing upon matter. Without doubt, the astronomer must make a great sacrifice for the fulfilment of this desire; but, in reality, this sacrifice is not greater than that entailed on our forefathers when they passed from the Julian to the Gregorian Notation of Time, or when they altered the commencement of the year: a sacrifice of convenience by which we yet suffer when it becomes necessary to refer to phenomena of remote dates. At this period, we must the less stand in fear of a like sacrifice, when by such means an acknowledged existing non-accord between science and ordinary life can be set aside: a non-accord which, it is true in individual cases, does not press heavily on the astronomer, but which is a constant source of inconvenience for non-professional astronomers who are desirous of making use of astronomical information. And in such respect, this sacrifice ceases so to be considered and is transformed into an act of public utility with regard to all astro-

nomical details which stand in clear relationship with the outer world in which almost daily conflicts come to the surface between the different designations of dates. Conflicts among others which are even injurious to astronomical labours in such observatories where observations are continually adjusted to the day. . . . While the Directors of the Pulkowa Observatory make their full acknowledgment to the Astronomer Royal for this precedent, which has been established, so are they ready to follow the example, and this fact leads us the more to expect that also this course will be adopted by the Washington Naval Observatory, as in the American Marine the Date Notation from midnight has been already accepted. It is only in the matter of the period when the Date Notation, according to Universal Time, should be introduced into the publications of the observatories, that we feel inclined to recommend that there should be delay until, in this respect, the most perfect possible understanding be attained by all astronomers, in order to avoid the much more critical disturbance in astronomical chronology which would arise if the transition to the new Date Notation was not equally followed on all sides. We are desirous, accordingly, of suggesting a suitable time-point for the commencement of the year for which the Nautical Almanac would inaugurate the changes corresponding to the requirements named. The latter, as has before been said, could come to pass in the year 1890. We would, however, ourselves prefer the change to take place, in the first instance, with the change of the century. Until that date it would probably be the simultaneous proceeding of all astronomers, with general consent, to look forward to this period of transition, and it would more easily stamp itself on the memory of all who hereafter would be busied in investigations in which exact chronology plays a part.—*Paper on the Washington Conference by Otto Struve, Director of the Imperial Astronomical Observatory, Pulkowa, Russia.*

III. The reasons for making the change, as affecting astronomers, are:—(1) The introduction of the Universal Day commencing at Greenwich Midnight, and reckoning from 0 to 24 hours makes it inexpedient to have another time reckoning of 0 to 24 hours starting from Greenwich Noon. There are already frequent mistakes of date arising from confusion between civil and astronomical reckoning, several practical observers using the former, which is also commonly employed in almanacs and occasionally in some astronomical periodicals. The use of *three* different systems of reckoning solar time would greatly increase the confusion. (2) The circumstances under which astronomical observations are made have completely changed in modern times since the application of powerful telescopes to meridian instruments and the development of Solar Physics. The change of date at noon in the middle of the day's work has thus, in many cases, become very inconvenient. (3) As regards meridian observations, the experience of the past year at Greenwich Observatory (where observations are carried on as continuously through the 24 hours as at any other observatory) shows that the whole of the astronomical day can be introduced very easily and with decided advantage on the whole. (4) In the case of extra-meridian observations, the observer usually finds it convenient to work in the earlier hours of the night, so that little or no inconvenience would result from a change of date at midnight. Discoverers of comets and observers of meteors, who observe in the early morning, often use civil reckoning, and mistakes of date have, on several occasions within my own

knowledge, resulted from the existence of two different modes of counting time. (5) For spectroscopic and photographic observations of the sun, it is now recognized that the day should be reckoned from midnight, and the same reckoning would naturally be used by the observer when he takes spectroscopic and photographic observations at night, and also in determinations of the places of comets, stars, etc., which he may make in connection with his spectroscopic observations. It seems absurd to expect the same observer to change his system of reckoning mean solar time according to the class of observations he is making at the moment. (6) The proposal to include in the routine work of an observatory, photography of the stars, as well as of the sun, will further increase the difficulty of maintaining a distinction as regards time-reckoning between the various classes of astronomical observations. (7) At many observatories, magnetical and meteorological observations are carried on concurrently with astronomical observations, and it is admitted that for the two former classes the day commencing at midnight should be used. (8) For the distribution of the time to the public, a work which is undertaken by many observatories, the civil day would be used. (9) Thus civil reckoning commencing at midnight must be used for solar, magnetical, and meteorological observations, and also for the distribution of time to the public, so that the retention of astronomical reckoning would involve the use of two different systems of mean solar clocks, differing by 12 hours, in the same observatory—a circumstance likely to lead to intolerable confusion. (10.) As regards the supposed discontinuity which would arise from the change in the Nautical Almanac, the difference of time-reckoning is precisely similar to that which would have to be taken into account in the comparison of Greenwich observations with those made at any other observatory. The astronomical calculator is in the habit under the present system of allowing for the difference in time-reckoning between different observatories, and his task would be greatly simplified if he had only to deal with universal time.—*Report to the Trustees of Greenwich Observatory, by W. H. M. Christie, M.A., LL.D., Astronomer Royal of England.*

IV. The first of these recommendations proposes a change in the method of counting astronomical time which has come down to us from antiquity, and which is now universal among astronomers. The practice of taking noon as the moment from which the hours were to be counted originated with Ptolemy. This practice is not, as some distinguished members of the Conference seem to have supposed, based solely upon the inconvenience to the astronomer of changing his day at midnight, but was adopted because it was the most natural method of measuring solar time. At any one place solar time is measured by the motion of the sun, and is expressed by the sun's hour angle. By uniform custom, hour angles are reckoned from the meridian of the place, and thus by a natural process the solar day is counted from the moment at which the sun passes over the meridian of the place or over the standard meridian. . . . A change in the system of reckoning astronomical time is not merely a change of habit, such as a new method of counting time in civil life would be, but a change in the whole literature and teaching of the subject. The existing system permeates all the volumes of ephemerides and observations which fill the library of the astronomer. All his text-books, all his teachings, his tables, his formulæ, and his habits of calculation are based on this system. To change the system will involve a change in many of the

precepts and methods laid down in his text books. . . . But this would only be the beginning of the confusion. Astronomical observations and ephemerides are made and printed not only for the present time, but for future generations and for future centuries. If the system is changed as proposed the astronomers of future generations who refer to these publications must bear the change in mind in order not to misinterpret the data before them. The case will be yet worse if the change is not made by all the ephemerides and astronomers at the same time epoch. It will then be necessary for the astronomers of the twentieth century, using ephemerides and observations of the present, to know, remember, and have constantly in mind a certain date different in each case at which the change was made. For example, if, as is officially announced, the Naval Observatory introduces the new system on January 1, 1885, then there will be for several years a lack of correspondence between the system of that establishment and the system of the American Ephemeris, which is prepared four years in advance. . . . I see no advantage in the change to compensate for this confusion. If astronomical ephemerides were in common use by those who are neither navigators nor astronomers the case would be different. But, as a matter of fact, no one u es these publications except those who are familiar with the method of reckoning time, and the change from astronomical to civil time is so simple as to cause no trouble whatever. The change will affect the navigator as well as the astronomer. Whether the navigator should commence his day at noon or midnight, it is certain that he must determine his latitude from the sun at noon. The present system of counting the day from noon enables him to do this in a simple manner, since he changes his own noon into the astronomical period by the simple addition or subtraction of his longitude. To introduce any change whatever into the habits of calculation of uneducated men is a slow and difficult process, and is the more difficult when a complex system is to be substituted for a simple one. I am decidedly of the opinion that any attempt to change the form of printing astronomical ephemerides for the use of our navigators would meet with objections so strong that they could not be practically overcome. . . . I respectfully submit that in view of these considerations no change should be made in the change of reckoning time employed in the publications of this office until, by some international arrangement, a common date shall be fixed by all nations for the change.—*Argument against changing the Astronomical Day, by Prof. S. Newcomb, LL.D., Etc., Superintendent of the Nautical Almanac Office, Washington, Dec. 6, 1884.*

V. Referring to the letter of Professor Newcomb, concerning the resolution of the late International Meridian Conference on the subject of the change of the astronomical date, so as to make the midnight of Greenwich 0 hours, instead of noon as at present, I have the honor to submit the following considerations. . . . The order referred to was not issued without a knowledge on my part of the views of such a distinguished astronomer as Professor Adams, of England, as well as of those of other members of the Conference. A reference to the proceedings of the Conference shows that its recommendation on this point was unanimous. It has been publicly announced in *Nature* that the Astronomer Royal of England proposes to make the change on the same date as that directed by me; this has been confirmed by a telegram received from him by me. So far as the counting of astronomical time from antiquity is concerned, it is the argument of conservatism which desires no change in an existing

order of affairs; yet, assenting to this argument, we might refer to a still remoter antiquity—to the time, not of Ptolemy, but of Hipparchus, the "Founder of Astronomy," who reckoned the twenty-four hours from midnight to midnight, just as the Conference has proposed. While it is unquestionably true that some confusion may occur, yet the liability to it will be almost entirely with the astronomer, who, through his superior education and training, could easily avoid it by careful attention to the ephemerides he was using. During the years of change, before the ephemerides are constructed in accordance with the new method, it will only be necessary to place at the head of each page of recorded observations the note that the time is reckoned from midnight, to call attention to the fact, and thus obviate the danger of error. It is an undeniable fact that the educated navigator finds the conversion of time a simple matter, yet experience has demonstrated that to the mariner who is not possessed of a mathematical education there is a decided liability to the confusion which is so greatly deprecated by all who are interested in this subject. I believe that to all navigators, at least to all English-speaking ones, the new method will prove itself decidedly advantageous. As is well-known, for many years navigators kept sea time, by which the day was considered to begin at noon, preceding the civil day by twelve and the astronomical day by twenty-four hours. The change to civil time now kept on board ship was effected readily and without friction, so that the recommendation of the Conference regarding the commencement of the nautical day has already been largely anticipated. The navigator is concerned not with his longitude but with his Greenwich time, having obtained which he can take from the Nautical Almanac the data he seeks, whether given for noon or midnight, and when the ephemerides shall have been made to conform to the new system there will be one time in common use by all the world. It seems to me eminently proper that the nation which called the Conference should be among the first to adopt its recommendations, and while it might possibly be better to wait until an entire agreement has been entered into by the astronomers of all nations, yet the fact that the first and most conservative observatory in the world has acceded to this proposal of the Conference would seem to be a sufficient reason why we should not wait for further developments. In deference, however, to the views so well advanced by Professor Newcomb, and in view of the fact that the President has recently transmitted the proceedings of the Conference to Congress, as well also of the desirability of securing uniformity among the astronomers of our own country at least, I have suspended the execution of the order for the present.—*Remarks by Commodore S. R. Franklin, Superintendent United States Naval Observatory, Washington, Dec. 11th, 1884.*

VI. The subject of reform in time-reckoning was brought before the Canadian Institute many years ago by Mr. Sandford Fleming. The reforms suggested were much needed, and were so ably advocated by Mr. Fleming that already several of them have been adopted not only on this continent, but in various countries all over the world. One important suggestion, however, although recommended by the Washington Conference, has not yet been acted upon, viz., the making of the astronomical and nautical day to accord with the civil day. It has been suggested that a body like this Society may render valuable assistance in this matter by collecting the opinions of astronomers on the subject. The Canadian Institute having been the first society to

bring the whole subject prominently and successfully before the world, it would be well for us to ask their co-operation with us in this matter. As an illustration of some of the inconveniences which result from the present want of accord between the astronomical and nautical day and the civil day, I may refer to a case within my own experience. In 1873 a sudden and very violent storm caused great destruction along the south-eastern coast of Nova Scotia. I had occasion to investigate that storm, and, for the purpose, obtained the logs of vessels which were caught in it. I was assisted in this by the late Sir Henry Lefroy, then Governor of the Bermudas, who procured the logs, or copies of the logs, of the ships which put into the islands for repairs. The satisfactory examination of these logs was attended by great difficulty owing to a want of uniformity among the sea captains in making entries. For instance, many of the captains wrote up their logs at noon for the twenty-four hours. Some of them were accustomed to enter up the events occurring between, say, noon of the 20th of the month and noon of the 21st, under the date of the 20th; that is, the astronomical and nautical day during which they happened, while others entered the same events under date of the 21st, or that upon which the entries were made, so that, in the absence of specific information, it was impossible to tell to which set of twenty-four hours any given event should be referred. Had the captains been in the habit of changing their dates at midnight, no such inconvenience would probably have resulted. For my part I am decidedly in favour of bringing Astronomical Time into harmony with civil reckoning at the change of the century. After considering all that can be said against any alteration in the present dual system, I am satisfied that any inconvenience which would result to individuals from the change would be limited in duration and would not be felt by a large number of persons. If it be determined once for all to abandon the double notation of dates at the beginning of the new century, ample time would be allowed for any necessary preparation for the change, and when the period of transition arrived any inconvenience which might temporarily be felt could not be compared with the advantages which would follow in all future years from uniformity of reckoning.—*Remarks to the Astronomical and Physical Society of Toronto, by Charles Carpmael, Esq., Superintendent of the Meteorological Service of Canada, February 11th, 1893.*

VII. The Canadian Institute, which took the initiative in bringing before the Scientific world, in 1879, the principle of Universal Time Reckoning, heartily co-operates with its sister society in the endeavor to bring the Astronomical day within the sphere of uniformity it has continuously advocated. The Council of the Institute approves of the terms of the Circular Letter prepared by the Joint Committee under the Chairmanship of Mr. Sandford Fleming, long identified with this subject, and an honourary member of both societies. It is not easy for me to conceive any reason for beginning the day at noon, other than the convenience of having all the hours of darkness brought within one astronomical day. Stellar observations for the purpose of practical astronomy no longer requiring darkness, this reason no longer exists, and I trust we are now warranted in expecting the abolition of a double notation of date as the result of our efforts.—*Arthur Harvey, Esq., President of the Canadian Institute, Toronto, April, 1893.*

GENERAL BIBLIOGRAPHY OF ORIGINAL CONTRIBUTIONS TO THE PUBLICATIONS OF THE CANADIAN INSTITUTE.

The following list of the original contributions to the Canadian Institute publications has been prepared by David R. Keys, librarian of the Institute, assisted by Doctors Bell, Coleman, and Needler, and Messrs. Dewar, Harvey, Pursey and Spry. The share taken by these gentlemen is indicated under the section Bibliography.

The Publications of the Canadian Institute have appeared in four series, as follows :—

1. The FIRST SERIES began August, 1852; concluded December, 1855; contains 41 numbers in 3 vols. 4to. It has for title, "The Canadian Journal; a Repertory of Industry, Science, and Art; and a Record of the Proceedings of the Canadian Institute."

2. The SECOND SERIES began January, 1856; concluded January, 1878; contains 92 numbers in 15 vols. 8vo. It has for title, "The Canadian Journal of Science, Literature, and History."

3. The THIRD SERIES commenced in 1879, concluded April, 1890; contains 20 numbers in 7 vols. Its title is "Proceedings of the Canadian Institute."

4. The FOURTH SERIES commenced October, 1890. Its title is "Transactions of the Canadian Institute."

In the list, the large Roman numerals refer to the Series, the small Roman numerals to the Volume, and the Arabic number to the Page. Papers marked *tit.* have not been printed in the Institute's publications.

ARCHÆOLOGY (See also Classical Philology, Ethnology, History and Linguistics.)

	Series.	Vol.	Page.
WILSON (PROF. DAN.)—Some Coincidences between the Primitive Antiquities of the Old and the New World	I.	ii.	213
Hints for the Formation of a Canadian Collection of Crania.	I.	iii.	345-47
Remarks on the Intrusion of the Germanic Races on the Area of the Older Celtic Races of Europe	I.	ii.	246
Observations suggested by Specimens of a Class of Conchological Relics of the Red Indian Tribes of Canada West	I.	iii.	155-59
Displacement and Extinction among the Primeval Races of Man	II.	i.	4
The Ancient Miners of Lake Superior	II.	i.	225-37
Discovery of Indian Remains, County Norfolk, Can. West.	II.	i.	511-19
The Quigrich	II.	iv.	429-41
Illustrations of the Significance of certain Ancient British Skull Forms. *(Id.)*	II.	viii.	127-57
Notice of a remarkable Memorial Horn, the Pledge of a Treaty with the Creek Nation in 1765	III.	i.	255-60
The Bohemian Skull. *(Tit.)*	III.	iii.	43
Some Stone Implements from Lake St. John, Quebec. *(Tit.)*	III.	v.	124

ART.

	Series.	Vol.	Page.
FORSTER, (J. W. L.)—Art in Canada To-day	IV.	ii.	113-15
HOWLAND (HENRY S., Jr.)—The Art of Etching	III.	ii.	242-44
INGLIS (REV. DAVID).—On the Relation of Quantity to the Æsthetic Sentiment	II.	iii.	409-14
LAUDER (W. W.)—History of Musical Instruments. *(Tit.)*	III.	ii.	144
SCADDING (DR. H.)—Canada in Sculpture	III.	v.	132-33
SHERWOOD (W. A., Esq.)—Colour in Nature	III.	vii.	19-20
WILSON (PROF. D.)—Paul Kane, The Canadian Artist	II.	xiii.	66-72
Ancient Celtic Art. *(Tit.)*	III.	iv.	191

ASTRONOMY.—Including Climatology and Meteorology.

ASHE (LIEUT. E. D.)—On the employment of the electric telegraph in determining the longitude of some of the principal places in Canada	II.	iv.	453-65
CARPMAEL (C.)—On the reduction of the barometer to sea level	III.	i.	1-14
CHAPMAN (E. J.)—Note on the cause of tides	II.	xiv.	279-80
CHERRIMAN (PROF. J. B.)—Atmospheric Phenomena of light	I.	i.	6, 26
On the variations of temperature in Toronto	I.	ii.	14-18
General Meteorological Register for Toronto, 1853	I.	ii.	185-6
Mean Meteorological Results at Toronto during the year 1854	I.	iii.	161-63
CLARK (J. M., M.A., LL.B.)—The Luminiferous Ether	IV.	ii.	93-97
CRAIGIE (W., M.D.)—Meteorological Observations at Hamilton	I.	ii.	187-8
Mean Meteorological Results at Hamilton for 1854	I.	iii.	172
DADE (REV. C.)—Remarks on the Law of Storms, as set forth in a tract published by Richard Budgen, in the year 1730	II.	v.	294-99
Lunar Influences	II.	xiii.	335-40 422-5
Biographical notice of. (By H. S.)	II.	xiii.	352-54
ELVINS (ANDREW).—The Outburst of Sun Spots in 1887	III.	vi.	24-25
FLEMING (SANDFORD, C. E., C. M. G., LL.D.)—Time-Reckoning. *(Ill.)*	III.	i.	97-137
Longitude and Time Reckoning. *(Ill.)*	III.	i.	138-49
Universal or Cosmic Time	III.	iii.	60-77
And in supplementary pamphlet of 101 pp.			
Scientific Time Reckoning. *(Map)*	IV.	i.	227-38
Reforms in Time Reckoning. *(Ill.)*	IV.	ii.	128-42
HAHN (DR. OTTO).—Organisms in Meteorites. *(Tit.)*	III.	vii.	30
HENNING (THOS.)—Meteors and Falling Stars	I.	ii.	188-91 209-12
Remarks on the Planetoids Between Mars and Jupiter	I.	iii.	206-209
HIND (H. Y.)—Planet of Aug. 22nd, 1852	I.	i.	24, 287
HODGINS (J. G.)—Memo. on the steps taken by the Education Department to Establish a System of Meteorological Stations Throughout Upper Canada	I.	iii.	410-11
KINGSTON (G. T.)—On the Employment of the Electric Telegraph for Predicting Storms	II.	ii.	177-9
On Deducing the Mean Temperature of a Month	II.	iii.	5-7
Mean Meteorological Results at Toronto for the year 1861.	II.	vii.	97-103
On the Annual and Diurnal Distribution of the Different Winds at Toronto	II.	ix.	10-25

	Series.	Vol.	Page.
KINGSTON (G. T.)—On Magnetic Disturbances at Toronto during the year 1856-62, inclusive	II.	viii.	157-67
Mean Meteorological Results at Toronto for the year 1862.	II.	viii.	238-45
On the Abnormal Variations of some of the Meteorological Elements at Toronto and their Relations to the direction of the Wind	II.	ix.	109-29
Mean Meteorological Results at Toronto for the year 1863.	II.	ix.	171-77
On the relative duration of the Different Winds during Rain or Snow....in the years 1853 to 1859	II.	ix.	240-48
Mean Meteorological Results at Toronto for the year 1864.	II.	x.	108-13
Monthly Absolute Values of the Magnetic Elements at Toronto, from 1856 to 1864, inclusive	II.	x.	114-18
Monthly Absolute Values of the Magnetic Elements at Toronto, from 1865 to 1868, inclusive, with the annual means from 1841 to 1868	II.	xii.	263-64
On the Annual Distribution of Temperature at Toronto in the years 1858-68	II.	xii.	474-7
On the Change of Barometric Pressure and Pressure of Vapour that accompany different winds, at Toronto, from observations in the seven years, 1860-66, inclusive.	II.	xii.	303-7
On the Diurnal and Annual Variations of Temperature at Halifax, N.S.	II.	xiii.	26-32
LACHLAN (MAJOR R.)—On the establishment of a System of Simultaneous Meteorological Observations etc., throughout the British American Provinces	I.	ii. iii.	241-46 405
On the periodical rise and fall of the Lakes	I.	ii.	293-305
Account of a sudden fall in the waters of the Niagara River, March, 1848	I.	iii.	204
MACDOUGALL (ALAN, M. Inst., C. E.)—The Water Temperatures of Lake Ontario. *(Tit.)*	III.	vi.	27
MACGREGOR (C. J.)—On the Climatology of Stratford, Ontario	II.	xii.	470-73
MURRAY (ALEX.)—Meteorological Observations on Lake Nipissing, October and November, 1854	I.	iii.	146
LEFROY (CAPT. J. H., R.A., F.R.S.)—Remarks on Thermometric Registers	I.	i.	29-31 75-77
LIVINGSTONE (J. A.)—Notes on Astronomy. *(Tit.)*	III.	v.	145
The purposes of Comets	III.	vii.	9
LOUDON (W. J.)—The Decimal System Applied to Time. *(Ill.)*	III.	iii.	118-19
MOWATT (J. G.)—A few Canadian Climates	III.	ii.	195-215
NEWTON (J. T.)—Meteorological Observations, Fort Brady, Michigan, February, 1855	I.	iii.	245
NOBLE (LIEUT.) and CAMPBELL, (Mr. W. D. C.)—Monthly Meteorological Register for Quebec	I.	iii.	120
PHILLIPS (J.)—The Centrifugal Forces of the Planets	III.	iii.	122-25
" " " *(Tit.)*	III.	v.	145
ROTTENBURG (COL. BARON DE).—The supposed Self-Luminosity of the Planet Neptune	II.	i.	424-29
Report of the Committee on Prof. Kingston's Plan for Predicting Storms	II.	ii.	179-80
Solar Spots observed at Toronto in January, February and March, 1858	II.	iii.	293-97

	SERIES.	VOL.	PAGE.
SWALLWOOD (PROF. CHARLES)—Contributions to Meteorology, from observations taken at St. Martin, Isle Jesus, Canada East	II.	iv.	262-66
The Observatory at St. Martin, Isle Jesus, Canada East. *(Ill.)*	II.	iii.	281-92
SWALLWOOD (PROF. CHARLES)—Mean Results of Monthly Meteorological Registers at St. Martin, Isle Jesus, Canada East	I.	iii.	214
Remarkable Low Temperature at St. Martin, Isle Jesus, December, 1854	I.	iii.	171
Temperature of the Cold Days of February, 1855	I;	iii.	196
STUPART (R. F.)—Barometric Pressures. *(Tit.)*	III.	v.	111
THOMSON (A. C.)—Notice of Mock Suns, as seen near the Muskoka River, in November, 1861	II.	vii.	462
TOMKINS (W. GRÆME).—Comparative Tabular Meteorological Observations in Canada, England and Russia	II.	iv.	389-95
WILLIAMSON PROF. JAS.)—On the Longitude of Kingston	I.	iii.	82
Donati's Comet	II.	iii.	486-88

BIBLIOGRAPHY.

ANON.—Canadian Ornithological Bibliography	IV.	i.	60-64
Catalogue of Books Exhibited at the Caxton Celebration (of 1877) in Toronto	II.	xv.	601-14
BELL (A. J.)—List of Contributions to classical Philology in Transactions of the Canadian Institute	IV.	iii.	323-4
CHAMBERLAIN (A. F.)—Bibliography of Canadian Archæology	III.	vii.	40-41
COLEMAN (A. P.)—List of Contributions to Geology in Transactions of the Canadian Institute	IV.	iii.	327-30
DEWAR (ROBERT).—List of Contributions to Chemistry and Mineralogy in Transactions of the Canadian Institute	IV.	iii.	324-5
HARVEY (ARTHUR).—Contributions to Geology and Mineralogy in the Transactions of the Canadian Institute	IV.	ii.	342-3
KEYS (DAVID R.)—Classified List of Original Contributions to the Transactions of the Canadian Institute from 1850-1893	IV.	iii.	317-36
NEEDLER (G. H.)—List of Contributions to Astronomy and Meteorology in the Transactions of the Canadian Institute	IV.	iii.	318-20
PURSEY (G. G.)—List of Contributions to Astronomy in the Transactions of the Canadian Institute	IV.	iii.	318-20
SPRY (WILLIAM)—List of Contributions to Engineering in the Transactions of the Canadian Institute	IV.	iii.	324-26

BIOLOGY (See also Archæology, Chemistry and Medicine).

ACHESON (GEO.)—Biological Study of Tapwater in the School of Practical Science, Toronto	III.	i.	413-26
ADAMSON (REV. W. A., D.C.L.)—Decrease, Restoration and Preservation of Salmon in Canada	II.	ii.	1-7
ALLAN (HON. G. W.)—On the land birds wintering in the neighborhood of Toronto	I.	i.	169-72
Some of our Migratory Birds	III.	iii.	87-100
ARMSTRONG (CHARLES).—Physianthus Albens	III.	vii.	230-31
BAILEY (BRUCE).—Coleoptera collected in Kicking Horse Pass	III.	v.	213-15

	Series.	Vol.	Page.
BARRETT (DR. MICHAEL).—On the Composition, Structure and Development of Bone	II.	x.	194-204
BETHUNE (REV. C. J. S.)—Nocturnal lepidoptera found in Canada	II.	viii.	1-16
		x.	247-60
BOVELL (DR. JAS.)—The Anatomy of the Leech	II.	i.	27-33
Note on the Preservation of some Infusoria with a view to the display of their Cilia	II.	viii.	341-2
On the Structure of certain parts of the Bear and Lobster	I.	iii.	203-4
BRODIE (WM.)—Food Plants of Platysamia Cecropia	III.	iv.	211-13
BUCHAN (J. M.)—Notes on the Flora of Hamilton	II.	xiii.	281-304
Flora Hamiltonensis	III.	ii.	145-56
CHAPMAN (PROF. E. J.)—Habits of a Small Snake in Captivity	II.	xiii.	551-56
COTTLE (DR. THOS.)—Notes on the Canadian Saturniæ	I.	ii.	212-13
The Evening Grosbeak, Coccothraustes vespertina	I.	iii.	287
The Mastodon giganteus	I.	iii.	405-6
Capture of Two Birds of unusual occurrence in Upper Canada (Picus meridionalis, Ortygometra jamaiciensis)	II.	iv.	388-89
On the Two Species of Astacus found in Upper Canada	II.	viii.	216 19
COUPER (WM.)—Coleoptera Collected in Canada	I.	iii.	210-13
	II.	i.	33-39
CRAIGIE (DR. and MR. W.)—List of Indigenous Plants found in the Neighborhood of Hamilton, with the dates of their being found in flower and examined	I.	ii.	222-23
FREELAND (PATRICK).—New Traversing Stage for the Microscope	II.	ii.	277-80
On the Movements of the Diatomaceæ	II.	vi.	324-27
GARDEN (J. F.)—Teredo navalis	III.	vi.	17-18
GARNIER (DR. R.)—New Species of Menobranchus	III.	v.	218-19
GEDDES (CAPT. GAMBLE).—The Affection of Insects for their Young.	III.	iii.	42
An Entomological Trip in the Rockies	III.	ii.	232-42
GIBSON (JOHN) and MACOUN (JOHN).—Botany of the Eastern Coast of Lake Huron	II.	xiv.	467-78
			635-57
Flora of the Valley of the St. Lawrence and the Great Lakes	II.	xv.	51-66, 161-76, 349-64, 429-35, 546-56
HARVEY (ARTHUR).—The Cruel Plant *(Physianthus Albens). (Ill.)*	III.	vii.	226-29
HINCKS (PROF. W.)—Observations on a specimen of Sula Bassana	II.	vii.	329-36
Materials for a Fauna Canadensis	II.	vii.	446-61
			484-502
The Struthionidae. *(Ill.)*	II.	viii.	462-6
Considerations Respecting Anomalous Vegetable Structures.	II.	iii.	311-18
Remarks on the Classification of Mammalia	II.	v.	512-16
Canadian Falconidæ	II.	iv.	443-49
Questions in Relation to the Theory of the Structure of Plants. *(Ill.)*	II.	v.	332-40
Specimen of a Flora of Canada	II.	vi	165-68
			276-84
On an Improved classification of Fruits	II.	vi.	495-7
Fissirostral Suborder of Insessorial Birds	II.	ix.	230-40
Remarks on the Principles of Classification in the Animal Kingdom in reference to a paper by Prin. Dawson	II.	x.	19-30
On Chorisis	II.	x.	371-85
Some Thoughts on Classification in Relation to Organised Beings	II.	xi.	31-45

	Series.	Vol.	Page.
HINCKS (PROF. W.)—Grallatores: Waders or Stilted Birds	II.	x.	147-62
Molluscous Animals	II.	xi.	319-27
	II., xi., 392-8,	xii.	26-35
Illustrations of the Genus Carex	II.	xi.	398-9
Improvement in the Arrangement of Ferns	II.	xii.	358 69
Biographical Sketch of	II.	xiii.	253-4
HINDE (G. J.)—Note on Distribution of Xanthium Spinosum	II.	xv.	642-3
HOLDER (EDW., M.D.)—On the Poisonous Plants which are Indigenous to or which have been Naturalized in the Neighborhood of Toronto	I.	i.	204-7 218-9
HODGINS (J. G.)—Proteus on the Lakes	II.	i.	19-23
LAWSON (GEORGE, Ph.D., LL.D.)—The Canadian Species of Picea or Spruce Firs	III.	vi.	31,160-80
MACALLUM (A. B., M.A., PH.D)—Studies on the Blood of Amphibia. *(Ill.)*	IV.	ii.	221-60
Morphology and Physiology of the Cell. *(Ill.)*	IV.	i.	247-78
The Nasal Region in Eutaenia. *(Ill.)*	III.	i.	390-404
Alimentary Canal, Liver, Pancreas and Air Bladder of Amiurus Catus. *(Ill.)*	III.	ii.	387-417
Theories of Heredity. *(Tit.)*	III.	v.	124
Some Pathological Growths in Lower Animals. *(Tit.)*	III.	v.	146
Origin of Haemoglobin. *(Tit.)*	III.	v.	192
The Alimentary Canal in Ganoid Fishes	III.	iii.	271-74
The Nerve Endings in the Cutaneous Epithelium of the Tadpole	III.	iii.	276-7
McCHARLES (A.)—The Extinct Cuttlefish in the North-West. *(Tit.)*	III.	iii.	270
MACKENZIE (J. J., B.A.)—Preliminary List of Algae	III.	vii.	270-74
MACKENZIE (T.)—Blood Vascular System, etc., of Amiurus Catus. *(Ill.)*	III.	ii.	417-43
McILWRAITH (THOS.)—Notices of Birds observed near Hamilton, C.W.	II.	vi.	6-18 129-38
McMURRICH, (J. P.)—Notes on some Canadian Infusoria. *(Ill)*	III.	i.	300-9
The Myology of Amiurus Catus. *(Ill.)*	III.	ii.	311-51
MACOUN (JOHN).—Notes on the Physical Phenomena of Manitoba	III.	i.	151-59
MORRIS (BEVERLEY R.)—Description of Intestinal Worm from Duodenum of the Canadian Whitefish. *(Ill.)*	II.	iv.	442-43
On the Powers of certain Water Birds to Remain Partially Submerged in Deep Water	II.	vii.	509-15
NEILSON (HUGH).—Recent Advances in Telegraphy and Telephony	III.	vi.	20
NICHOLSON (PROF. H. A.)—Contributions to a Fauna Canadensis. *(Ill.)*	II.	xiii.	490-506
OILLE (LUCIUS).—On Parasites	II.	iv.	4-40
PHIPPS (R. W.)—Forestry and the Necessity for its Practice in Ontario	III.	iii.	109-12
PIPER (HARRY).—Notes on Zoology	III.	vi.	39
RICHARDSON (C. G.)—Maize and its Derivatives. *(Tit.)*	III.	vi.	17
ROBB (CHAS.)—Canadian Timber Trees	II.	vi.	28-40
ROBINSON (J.)—On Preserving Timber from Decay	II.	ii.	8-11
SAUNDERS (W.)—On the Occurrence of Vanessa Cænia in Canada West	II.	vi.	498-500
Synopsis of Canadian Arctiadæ	II.	viii.	349-77
Plants Collected in London, Canada West	II.	viii.	219-38
SETON (E. E. T.)—The Prairie Chicken	III.	i.	405-12

	Series.	Vol.	Page.
SETON (E. E. T.)—The Ruminants of the Northwest	III.	iii.	113-17
Outlines of Ornithology	III.	iii.	280
SHAW (W. R., M.D.)—Peach Yellows	IV.	ii.	209-20
SHUTT (FRANK T.)—Notes on the Anatomy of the Woodlouse	III.	iii.	293-4
SPOTTON (H. B.)—List of Plants Collected near Barrie	II.	xv.	46-50
STRATFORD (DR. S. P.)—Notes on the Natural History of New Zealand	II.	ii.	357-64
THOMPSON (ERNEST E.)—Ornithological Reports	III.	vii.	181-203
On the Use of Faunal Lists	III.	vii.	275-80
Note on Mr. Tyrrell's Catalogue of the Mammalia of Canada.	III.	vii.	178-80
Reply to Mr. Tyrrell's Note	III.	vii.	285-86
TUCKER (DR. DAVID).—On certain Modern Views concerning the Higher Mammalia	II.	ix.	154-70
TURNER (J. B.)—The Horse and its Rider	I.	i.	154, 180, 198
TYRRELL (J. B., M.A., F.G.S)—Reply to Mr. Thompson's Note	III.	vii.	281-84
Two species of Parasitic Mites (*Sarcoptes minor* and *Psorergates simplex*). (*Ill.*)	III.	i.	332-43
Mammalia of Canada	III.	vi.	40, 66-91
WILLIAMS (J. B.)—Destruction of Wild Animals	III.	iv.	142-46
Canadian Woodpeckers. (*Tit.*)	III.	v.	193
WILLIAMSON (A. E.)—A Proposed Classification of the Genus helix	II.	viii.	343-8
Note on Land and Fresh Water Shells, collected near Toronto	II.	vi.	327-9
WRIGHT (PROF. R. R.)—Haeckel's "Anthropogenie."	II.	xv.	231-48
The systematic position of the Spongiadae	II.	xv.	417-28
Contributions to American Helminthology. (*Ill.*)	III.	i.	54-75
Notes on American Parasitic Copepoda. (*Ill.*)	III.	i.	243-54
Demodex Phylloides (Csokor) in the skin of Canadian Swine. (*Ill.*)	III.	i.	275-81
On the skin and Cutaneous Sense Organs of Amiurus. (*Ill.*)	III.	ii.	251-69
On the Nervous System and Sense Organs of Amiurus. (*Ill.*)	III.	ii.	352-86
The Osteology of Amiurus Catus. (*Ill.*)	III.	ii.	270-310

CLASSICAL PHILOLOGY.

CAMPBELL (PROF. J., M.A.)—Birthplace of Ancient Religions and Civilizations	II.	xiii.	152-78
Primitive History of the Ionians	II.	xiv.	395-431, 559-79
Etruria Capta, Part I	III.	iii.	144-266
FERGUSON (REV. PROF.)—The Etruscan Question	III.	v.	84-105
HUTTON (PROF. M.)—Classical Notes	III.	iv.	17-26
LOUDON (PROF. JAS., M.A.)—On Latin Pronunciation	II.	xii.	460-69
McCAUL (REV. J., LL.D.)—Notes on Latin Inscriptions found in Britain. (*Ill.*) II. iii 7-15, 220-230; II. iv. 173-80, 349-59; II. v. 283-94, 483-96; II. vi. 230-47, 395-413; II. vii. 28-42; II. ix. 217-25; II. x. 95-108; II. x. 303-32; II. xii. 108-34.			
Tesseræ Consulares	II.	viii.	427-36
Inscribed Sling Bullets	II.	ix.	92-102
Christian Epitaphs of the First Six Centuries. (*Ill.*)	II	xi.	271-300, 351-66; xii. 1-26.
Identified Stations on the Southern Roman Barrier in Britain	II.	xiii.	136-51
Ancient Carved Stone found at Chesterholm, Northumberland. (*Ill.*)	II.	xiv.	1-8

	Series.	Vol.	Page.
McCAUL (REV. J., LL.D.)—Inscriptiones Britanniæ Latinæ (Review)..	II.	xiv.	145-57
Lapidarium Septentrionale (Review)....	II.	xiv.	543-58
Sylva Critica Canadensium....	III.	i.	76-88
McNISH (REV. N.)—The Hades of Homer and the Hades of Virgil....	II.	xv.	646-58
Umbria Capta	III.	v.	219-40
PARRY (REV. E. ST. JOHN, M.A.)—Some Points connected with the Early History of Rome	I.	ii.	218-22
PEARMAN (W. D., M.A.)—Classical Notes..... ...	II. xiii. 426-27;	II. xiv.	51-54
Critical Notes: Chiefly on the De Legibus of Cicero.....	II.	xiv.	503-12
Some Observations on the Philebus of Plato	III.	i.	160-70
Sylva Critica Canadensium....	III.	i.	88-94
SCADDING (REV. H., D.D.)—Memoranda of Vesuvius and its Neighborhood....	I.	ii.	237-41, 261-64
Phonetic Anomalies observed in some Modern Forms of Ancient Proper Names.	II.	viii.	329-41
Descriptive Catalogue of Coins, Ancient and Modern, in the Collection of the Canadian Institute.....	II.	ix.	105-8, 226-30
On Errata Recepta. II. ix. 137-53, 317-26; II, x. 31-40; II. x. 386-406; II. xi. 45-71.			223-32,
On Metonyms	II.	xii.	35-56
Merton College and Canada	II.	xiii.	453-89
YOUNG (REV. G. P.)—Notes on Passages in the Platonic Dialogues....	II.	vii.	477-83

CHEMISTRY. (See also Biology, Mineralogy and Geology).

BRONDGEEST (J. T.)—Preservation of Food	I.	ii.	107-10
BRYCE (P. H., M.A., M.D.)—Natural History of Ground Waters.....	IV.	i.	149-69
CROFT (PROF. HENRY, D.C.L.)—Gas Patents	I.	i.	28, 77
Some New Salts of Cadmium and the Iodides of Barium and Strontium	II.	i.	13-19
Hydrate of Hydrosulphuric Acid	II.	i.	126-27
Report on Copper Instruments found near Brockville.....	II.	i.	334-36
Notes on the Oxalate of Manganese	II.	ii.	30-32
The Action of Air on Alkalic Arsenites	II.	iii.	126-28
Notes on the Oxalate of Iron	II.	vi.	18-20
Thallium	II.	ix.	405-11
Iodide of Barium and the Oxidation of Alkaline Arsenites..	II.	x.	333-34
Anomalous Production of Ozone	II.	xiii.	239-40
CHAPMAN (PROF. E. J., LL.D.)—On the Assaying of Coals by the Blowpipe. *(III.)*	II.	iii.	208-19
Atomic Constitution and Crystalline form as Classification Characters in Mineralogy....	II.	ii.	435-39
DEWAR (R.)—Arsenic and Sulphur	IV.	i.	141-8
DOBSON (CHAS. M.)—The Electro-Mercurial Amalgamation of the Precious Metals from Argentiferous and Auriferous Ores ..	III.	vi.	22-3
ELLIS and BABINGTON (DRS.)—Methyl Alcohol.....	III.	vii.	26
ELLIS (DR. W. H.)—Nitro-glycerine	II.	xiv.	356-66
A California Borax Deposit....	II.	xv.	328-9
Tannin in Cloves	III.	iv.	214-15
Chemistry of the Natural Waters of Ontario. *(Tit.)*	III.	v.	123
HALL (T. P.)—Photography and the Chemical Action of Light	III.	ii.	220-21
HUNT (T. STERRY., LL.D., D.Sc.)—The Theory of Types in Chemistry	II.	vi.	120-29

	Series.	Vol.	Page.
McGILL (A.)—Reichert's Distillation Process for the Identification of Butter Fat	III.	v.	39-44
Tartaric Acid in Admixtures. *(Tit.)*	III.	v.	212
RICHARDSON (C. GORDON.)—Dextrine Maltose in Beer Worts	III.	v.	132-35
ROBINSON (JOSEPH)—Preserving Timber from Decay	II.	ii.	8-11

ENGINEERING.

ANON.—Toronto Harbour	I.	iii.	68
Description of Mill-Dam and Bridge	I.	i.	10
A MEMBER OF THE INSTITUTE.—Railway Termini and Pleasure Grounds, Toronto	I.	i.	233
BACHE (A. D.)—Notes on Measurement of Base Line on Epping Plains, Maine. For Coast Survey	II.	iii.	74
BRUNEL (ALFRED, C. E.)—Engineering Contributions to the "Journal"	II.	i.	199
Economy of Fuel for Steam Machinery	II.	i.	336-44
Victoria Bridge, Paper on Report of R. Stephenson	II.	i.	467
C. (F. W.)—Preservation of Timber	II.	i.	559
CHAPMAN (PROF. E. J.)—A Table for calculating the Weight and Yield per Running Fathom of Mineral Veins	II.	xii.	478-79
CLARK (LEVI J.)—The Sewage Problem in Toronto	III.	vii.	36-38
City Sanitation and Sewage Disposal	III.	vii.	232-44
A Consideration of Sewerage Schemes	IV.	ii.	143-53
CLARKE (T. C., C.E.)—Action of Ice on Bridge at Rice Lake	I.	iii.	249
CUMBERLAND (FRED., C.E.)—Notes of a Visit to the G. T. R. Works West of Toronto	I.	iii.	225
DUMBLE (J. H., C.E.)—On the Contraction and Expansion of Ice	II.	v.	418-23
Ice Phenomena on Rice Lake. *(Ill.)*	II.	iii.	414-22
FLEMING (SANDFORD, C.E., P.L.S.)—Patent Centre Line Railway	I.	i.	93
New Compound Rail. *(Ill.)*	II.	iii.	473-80
Toronto Harbour, Its Formation and Preservation	I.	ii.	105-7, 223-30
Report on Preservation and Improvement of Toronto Harbor	I.	iii.	15
GILBERT (JAS.)—The Arizona Copper Mine	II.	ii.	321-24
HARVEY (ARTHUR).—Remarks on the Sewage Problem in Toronto	IV.	i.	5
HOUGHTON (JACOB, C.E.)—Water Works in the United States	I.	iii.	259
HECTOR (THOS.)—Scale for the Computation of the Area of Irregular Figures	II.	iii.	309-10
KEEFER (T. C., C.E.)—Notes on Anchor Ice	II.	vii.	173-80
Report on Railway Bridge over the St. Lawrence at Montreal	I.	ii.	76
LACHLAN (MAJOR R.)—On the Formation of Canal between Lakes St. Clair and Erie	I.	iii.	303
LAMB (DANIEL).—Handgrenades and Coal Torpedoes	III.	vii.	9
LEVEY (CH.)—Gold Mining in the Saskatchewan. *(Ill.)*	III.	iii.	267-9
Heat and Heating Buildings	III.	vii.	7
LOUDON (JAS.)—Notes on Ventilation	II.	xv.	645
MACDOUGALL (ALAN).—Aerial Navigation	III.	iv.	57
Present Efficiency in Disposal of Sewage	IV.	i.	37
MERRIT (W. H.)—Report on the Mining Industries of Canada	III.	v.	240-54
Iron and Steel Production in Ontario	IV.	ii.	299-314
MICKLE (GEORGE, B.A.)—Notes on Nickel	IV.	ii.	77-92

	SERIES.	VOL.	PAGE.
RICHARDSON (HUGH, Harbormaster).—Report on Preservation and Improvement of Toronto Harbor	I.	iii.	34
STEPHENSON (ROBT.)—Report on Victoria Bridge	I.	ii.	290
TRURAN (WM.)—On the Durability of Railway Iron	I.	iii.	237
TULLY (KIVAS, C.E.)—Report on Preservation and Improvement of Toronto Harbor	I.	iii.	29
ETHNOLOGY (See also History and Archæology).			
ASSIKINACK (F.)—(A Warrior of the Ottawas) Legends and Traditions of the Odahwahs	II.	iii.	115-25
			297-309
BELL (C. N.)—The Mound Builders in Canada	III.	iv.	131-37
BLEASDELL (WILLIAM).—The Indian Tribes of Canada	I.	iii.	209-10
BOYLE (DAVID).—Savagery in Civilization	III.	iii.	129-31
BROWNE (JAS.)—The Aborigines of Australia	II.	i.	251-71
Superstitions and Traditions of the Aborigines of Australia.	II.	i.	505-11
CHAMBERLAIN (A. F.)—The Mississaguas of Scugog	III.	vii.	2-3
Deluge Myths of the Canadian Indians	III.	vii.	11-13
Prehistoric Ethnology	III.	v.	144
CUMMING (W. H.)—On Marriage and Infanticide in China	II.	xi.	178-84
DARTNELL (G. H.)—Duration and Expectation of Life in Canada	I.	ii.	191
HARVEY (ARTHUR).—Celtic, Roman and Greek Types in France	IV.	ii.	176-208
HIND (H. Y.)Superstitions and Customs of the Assiniboine and Saskatchewan Indians	II.	iv.	253-62
KANE (PAUL).—Notes of Travels among the Walla Walla Indians	II.	i.	417-24
The Chinook Indians	II.	ii.	11-30
LEE (RICH.)—The Native Tribes of Polynesia	II.	xii.	443-59
McLEAN (REV. JOHN).—Mortuary Customs of the Blackfeet Indians	III.	v.	20-24
MATTHEWS (DR. PERCY W. P.)—Early Development of Aboriginal Women	III.	iv.	181-86
MORRIS (J. H.)—Travels in China	II.	ii.	161-76
PAYNE (F. F.)—The Eskimo of Hudson's Strait	III.	vi.	26,213-30
OJIJATEKHA.—Pagan Belief in Religion. *(Tit.)*	III.	vii.	43
REYNOLDS (THOS.)—Discovery of Copper and other Indian Relics near Brockville	II.	i.	329-36
STUPART (R. F.)—Eskimo of Stupart Bay. *(Ill.)*	III.	iv.	95-114
TUCKER (DAVID).—On Secluded Tribes of Uncivilized Men	II.	ix.	326-43
WALLBRIDGE (T. C.)—On some Ancient Mounds of the Bay of Quinte.	II.	v.	409-17
WILSON (SIR. DANIEL).—Narcotic Usages and Superstitions of the Old and New World. *(Ill.)*	II.	ii.	233-64
			324-44
Supposed Prevalence of One Cranial Type throughout the American Aborigines.	II.	ii.	406-35
Primæval Dexterity	III.	iii.	125-43
Some Ethnographic Phases of Conchology	II.	iii.	377-409
Notice of a Skull brought from the Crimea	II.	v.	321-31
Modifications affecting the Ethnic Significance of Peculiar Cranial Forms	II.	vi.	414-25
Ethnical Forms and Undesigned Artificial Distortions of the Human Cranium. *(Ill.)*	II.	vii.	399-446
Physical Characteristics of the Ancient and Modern Celt	II.	ix.	369-405
Race Head Forms and their Expression by Measurements.	II.	xii.	269-303
The Huron Race and its Head Form. *(Ill.)*	II.	xiii.	113-34
Righthandedness	II.	xiii.	193-231

	Series.	Vol.	Page.
WILSON (SIR DANIEL).—Hybridity and Absorption of the Red Indian Race	II.	xiv.	432-66
Interglacial American Man	II.	xv.	557-73
Brain Weight and Size in Relation to Relative Capacity of Races	II.	xv.	177-230
An Ancient Haunt of the Cervus Megaceros or Great Irish Deer	III.	i.	207-24

GEOGRAPHY (See also Archæology, Classical Philology, Geology and History.)

BROCK (HENRY).—The Upper Niagara River	III.	ii.	222-28
FLEMING (SANDFORD, C.E.)—On the Valley of the Nottawasaga. (*Ill.*)	I.	i.	223-26
GILBERT (G. R.)—Old Shore Lines in the Ontario Basin	III.	vi.	2-5
GOODBY (DR.) and BOVELL (JAS., M.D.)—Passing Visits to Rice Lake, Humber River, Grenadier's Pond and the Island. (*Natural History Specimens*)	I.	iii.	201
GORGENYI (ARTHUR).—Corea. (*Tit.*)	III.	v.	105
KANE (PAUL).—Incidents of Travel on the North West Coast, Vancouver's Island, Oregon, etc.	I.	iii.	273
PAYNE (F. F.)—Mammals and Birds of Prince of Wales Sound	III.	v.	111-23
SCADDING (REV. H., D.D.)—Memoranda of Vesuvius and its Neighbourhood	I.	ii.	237, 261
STRATFORD (G. S. T.)—Description of Louisburg, Cape Breton. (*Ill.*)	I.	i.	126-28
STUPART (CAPT.)—The Flying Proas of the Ladrone Islands. (*Ill.*)	III.	vii.	43,204-5
WILSON (SIR. DAN.)—The Southern Shores of Lake Superior	II.	i.	344-56

GEOLOGY (Including Mineralogy).

BARNETT (J. D.)—Mechanical Value and Treatment of Hard and Soft Coal	III.	iv.	82-92
BELL (ROBT.)—On the occurrence of Petroleum in the N.-W. Territories.	III.	i.	225-30
Geology of the Route of the Intercolonial Railway	II.	xv.	381-87
On the mode of occurrence of Apatite in Canada	III.	iii.	294-302
Marble Island, Hudson Bay. (*Ill.*)	III.	iv.	192-204
BILLINGS (ELKANAH.)—Some New Generæ and Species of Cystidea from the Trenton Limestone	I.	ii.	215-8, 251-3, 268-74
On the Fossil Corals of the Devonian rocks of Canada West. (*Ill.*)	II. iv. 97-140, v. 249-82 ; vi. 138-48, 253-74, 329-63		
Note on a New Genus of Palæozoic Brachiopoda	II.	vi.	148
BRYCE (P. H.)—Natural History of Ground Waters	IV.	i.	149-69
CHAPMAN (EDWARD J.)—A Review of the Trilobites. (*Ill.*)	II.	i.	271-86
New Trilobites from Canadian Rocks. (*Ill.*)	II.	iii.	230-38
New species of Asaphus	II.	iv.	1-4
Asaphus Megistos, etc. (*Ill.*)	II.	iv.	140-2
New species of Agelacrinites	II.	v.	358-65
Atomic Constitution and Crystalline form as Classification Characters in Mineralogy	II.	ii.	435-9
An outline of the Geology of Ontario	II.	xiv.	580-88
On the Leading Geological Areas of Canada	II.	xv.	13-22, 92-121
A popular exposition of the Minerals and Geology of Canada. (*Ill.*)	II.	v.	1-19, 168-82, 517-31 ; vi. 149-65, 425-55, 500-18 ; vii. 108-21 ; viii. 17-33, 111-27, 185-216, 437-62 ; ix. 1-10.

	SERIES.	VOL.	PAGE.
CHAPMAN (EDWARD J.)—Notes on the Drift Deposits of Western Canada, and on the ancient extension of the Lake Area of that region	II.	vi.	221-9
			497-8
On the Geology of Belleville and vicinity. *(Ill.)*	II.	v.	41-48
On the occurrence of Copper Ore in the Island of Grand Manan. *(Ill.)*	II.	xiii.	234-9
On Wolfram from Chief-Island, Lake Couchiching	II.	i.	308
On the Klaprothite or Lazulite of North Carolina	II.	vi.	363-8
			455-6
On the Position of Lievrite in the Mineral Series	II.	vii.	42-7
On the occurrence of Allanite or Orthite in Canadian Rocks	II.	ix.	103-5
On some minerals from Lake Superior	II.	x.	406-11
On the analysis of some Canadian Minerals	II.	xii.	265-8
		xiii.	507-9
On some Blow-pipe reactions	II.	xv.	249-58
On the Analysis of some Iron Ores and Ankerites from Londonderry, N. S	II.	xv.	414-16
On the Probable Nature of Protichnites	II.	xv.	486-90
Note on the Function of Salt in Sea-water	II.	xv.	329-31
Note on a Belt of Auriferous Country in the township of Marmora	II.	xiii.	330-34
On the occurrence of the Genus Cryptoceras in Silurian Rocks	I.	ii.	264-8
Note on Stelliform Crystals. *(Ill.)*	II.	vi.	1-6
Note on the object of the Salt Condition of the Sea	I.	iii.	186-7
			227-9
Note on the Presence of Phosphorus in Iron Wire	II.	ix.	170-1
On the Silver Locations of Thunder Bay. *(Ill.)*	II.	xii.	218-26
Contributions to Blow Pipe Analysis. *(Ill.)*	II.	x.	339-55
CLARK (LEVI J.)—Formation of Toronto Island. *(Ill.)*	IV.	i.	239-46
Lake Currents. *(Ill.)*	IV.	ii.	154-7
CROFT (HENRY).—Gas Patents	I.	i.	28,77
Mineral Springs of Canada	I.	i.	151-4
The Action of Air on Alkalic Arsenites	II.	iii.	126-8
DALE (T. NELSON).—On New England Upper Silurian	III.	iv.	69
On Metamorphism in the Rhode Island Coal Basin	III.	iii.	18-21
Geology of Mt. Greylock	III.	v.	145
DE CEW (JOHN).—Age of the Oriskany Sandstone	II.	vii.	190-93
DEWAR (ROBERT).—Gold and Silver in Iron Pyrites	IV.	ii.	121-7
Arsenic and Sulphur as Metallurgical Agents in the Treatment of Canadian Auriferous and Argentiferous Ores	IV.	i.	141-8
ELLIS (WILLIAM HENRY).—On a fragment of Silicified Wood from the Rocky Mountains	II.	xiv.	348-53
A California Borax Deposit	II.	xv.	328-9
FLEMING (SANDFORD).—Toronto Harbor, Formation and Preservation charts	I	ii.	105-7
			223-30
The Canadian Geological Survey and its Director, Sir. Wm. E. Logan	II.	i.	238-44
Oil Wells Enniskillen. *(Ill.)*	II.	viii.	246-2
GILBERT (G. R.)—Old Shore Lines in the Ontario Basin	III.	vi.	2-4
Davenport Gravel Drift. *(Ill.)*	II.	vi.	247-53

	Series.	Vol.	Page.
GILBERT (JAMES).—The Arizona Copper Mine	II.	ii.	321-24
HARVEY (ARTHUR).—The Geology of N. W. Lake Superior. *(Ill.)*	III.	vii.	218-25
Pelotechthen Balanoides—Concretion or Fossil?	IV.	i.	213-15
Bone Caves	IV.	i.	116-20
Contributions to Geology in Canadian Institute's Transactions	IV.	ii.	342-3
HIND (HENRY YOULE).—Notes on the Geology of Toronto	I.	i.	147-51
HINDE (GEO. JENNINGS.)—The Glacial and Interglacial Strata of Scarboro Heights and other localities near Toronto	II.	xv.	388-413
Occurrence of Calciferous Boulders near Toronto	II.	xv.	644
HUNT (THOS. STERRY).—On the Formation of Magnesian Limestones.	II.	iv.	184-6
On the Theory of Igneous Rocks and Volcanoes	II.	iii.	201-8
On the Origin and Metamorphosis of some Sedimentary Rocks	II.	ii.	355-7
IVES (JAS. T. B.)—Iron and other Ores of Ontario	III.	v.	185-92
Geology in the Public Schools	III.	v.	125-8
KENNEDY (WILLIAM).—The Central Basin of Tennessee, a study of Erosion. *(Ill.)*	III.	vii.	64-108
LACHLAN (MAJOR R.)—On the periodical rise and fall of the Lakes	I.	ii.	293-305
LAWSON (ANDREW C.)—Gneissic Foliation and Schistose Cleavage in Dykes, and their bearing on the problem of the origin of Archæan Rocks. *(Ill.)*	III.	iv.	115-28
Diabase Dykes of Rainy Lake	III.	v.	173-85
LENNOX (THOMAS H.)—On the Fossil Sharks of the Devonian	III.	iii.	120-21
LOGAN (SIR WM. E.)—On the Physical Structure of the Western District of Upper Canada. (Maps)	I.	iii.	1-2
On the Probable Subdivision of the Laurentian Rocks of Canada	II.	iii.	1-5
Relative dates of intrusive rocks cutting the Laurentian System in Canada	II.	iii.	107-10
On the Division of the Azoic Rocks of Canada into Huronian and Laurentian	II.	ii.	439-42
McRAE (JOHN C).—Geological formations at Port Colborne. *(Ill.)*	III.	vi.	46, 338-41
MERRITT (WM. HAMILTON).—The magnetic Iron Ores of Victoria County, with notes on Charcoal Smelting	III.	i.	261-7
Mining Industries of Canada. *(Tit.)*	III.	vi.	21
MICKLE (G.)—Notes on Nickel	IV.	ii.	77-92
MILLETT (JOHN R. A.)—On the Mineral wealth of Nova Scotia	I.	i.	241-2
NICHOLSON (H. ALLEYNE).—Contemporaneity of Strata and the doctrine of Geological continuity	II.	xiii.	269-81
On the Imperfection of the Geological Record. *(Ill.)*	II.	xiii.	379-91
Favosites in the Devonian Rocks of Western Ontario	II.	xiv.	38-50
Palaeontology of Ontario	II.	xiv.	125-36
Fossils of the Clinton, Niagara, and Guelph formations of Ontario	II.	xiv.	137-44
PANTON (T. HOYES).—Places of Geological Interest near Medicine Hat	III.	v.	150-59
The Caves and Potholes at Rockwood, Ont	III.	vi.	244-53
RAE (JOHN).—Formation of Icebergs and Transportation of Boulders by Ice	II.	iv.	180-83
ROBB (CHAS.)—Observations on the Physical Geology of the Western Districts of Ontario	II.	v.	497-512
On the Petroleum Springs of Western Canada	II.	vii.	313

	SERIES.	VOL.	PAGE.
SMITH (J. F., JR.)—Fossils of the Hudson River Group, Toronto	II.	iv.	450-52
New species of Triarthrus	II.	vi.	275
SCHUTT (F. T.)—Canadian Apatite	III.	v.	30-38
THOMSON (J. L.)—On the cause of Glacier Motion	II.	xii.	412-14
WOOD (HERBERT R.)—The Kaministiquia Silver-bearing Belt	III.	vii.	245-59
Contributions to Blowpipe Analysis. (*Tit.*)	III.	v.	56

HISTORY (See also Archæology, Classical Philology, Ethnology and Geography.)

ANON.—Lands and Population in the United States and Upper Canada	I.	ii.	286-90
BAIN (JAS., JR.)—The Present Condition of the Old French Fort at Ste. Marie	III.	iii.	278
BLACK (ALEXANDER D.)—Genesis of the Heaven and the Earth. (*Tit.*)	III.	vii.	27
BOYLE (DAVID).—Archæological Remains	IV.	i.	67-71
The Discoverer of the Great Falls of Labrador	IV.	ii.	332-41
BROWNING (T. B.)—The Chamberlain Treaty—1888. (*Tit.*)	III.	vi.	42
The French Shore Question	III.	vii.	33-35
England's Oldest Colony (Newfoundland)	III.	ii.	50-52
The Alaska Boundary	III.	v.	132
The Indians of Canada. (*Tit.*)	III.	vii.	59
The Fishery Question. (*Tit.*)	III.	iv.	175
CAMPBELL (REV. J.)—The Pharoah of the Exodus Identified in the Myth of Adonis	II.	xiii.	33-62
The Birthplace of Ancient Religions and Civilization	II.	xiii.	152-78
CANNIFF (WILLIAM).—Survey of Niagara Township	IV.	i.	96-101
CARNOCHAN (JANET).—Fort George's Lonely Sycamore. (*Poem.*)	IV.	i.	124-27
Two Frontier Churches	IV.	i.	109-24
CRUIKSHANK (CAPT. ERNEST)—Administration of Lt.-Gov. Simcoe.	IV.	ii.	284-98
HAMILTON (J. C.)—The Mound Builders of America	III.	vii.	41-43
The Maroons of Jamaica and Nova Scotia	III.	vii.	260-69
Slavery in Canada	IV.	i.	102-8
HARVEY (ARTHUR).—Bone-Caves	IV.	ii.	116-20
HIND (H. Y.)—A Glance at the Political and Commercial Importance of Central British America	II.	viii.	409-27
HOPKINS (J. C.)—The Progress of Canada. (*Tit.*)	III.	vii.	10
HOUSTON (WILLIAM.)—First Legislative Work of Upper Canada	IV.	i.	77-85
KANE (PAUL).—Notes of a Sojourn Among the Half-breeds, Hudson Bay Co's Territory, Red River	II.	i.	128-38
KINGSFORD (R. E.)—The Campaign of 1815. (*Map*)	III.	iv.	149-74
LABOUREAU (REV. FATHER).—Reminiscences of the Huron Missions (*Tit.*)	III.	v.	149
LANGTON (J.)—Early Discoveries of the French in North America. (*Map*)	II.	ii.	393-406
LEFROY (CAPT. J. H.)—On the Probable number of the Native Indian Population of British America	I.	i.	193-98
MACDONELL (HON. ALEX.)—Diary of Governor Simcoe's Journey	IV.	i.	128-39
MACDOUGALL (ALAN.)—The Bœothick Indians	IV.	ii.	98-102
McKELLAR (SHERIFF).—A Bragh or Stone Flour Mill. (*Tit.*)	III.	v.	193
McLEAN (REV. JNO.)—The Blackfoot Confederacy	III.	vii.	17-18
MORICE (REV. A. G., O.M.I.)—The Western Dénés. (*Ill.*)	III.	vii.	59, 109-74
O'SULLIVAN (D. A.)—Experiments in Governing Canada	III.	vi.	6, 254-60
PERRY (A. B.)—The Indians of the North West	III.	vii.	175-7
READ (D. B.)—Newark in 1792	IV.	i.	72-6
The Hurons	IV.	i.	86-95

	Series.	Vol.	Page.
SCADDING (REV .HENRY).—Lahontan	II.	xiii.	304-29
Yonge and Dundas Sts. *(Ill.)*	II.	xv.	615-41
Canadian Local History (The 1st Gazetteer of U. Canada).	II.	xiv.	55-72; 208-17, 305-8, 367-87, 513-41, 658-74.
Toronto of Old	II.	xii.	149-74, 227-62, 333-54, 431-8, 514-32; xiii. 82-112, 179-91, 256-68, 355-78, 433-52, 562-80.
SPENCER (J. W.)—The Iroquois Beach. *(Tit.)*	III.	vi.	31
STUPART (CAPT., R.N.)—Whence did the Scandinavians Obtain their Knowledge of the Compass?	III.	vi.	44-45
TYRRELL (J. B.)—David Thompson, The Pioneer Geographer of the North-West	III.	vi.	31, 135-60
WILSON (SIR DANIEL).—Science in Rupert's Land	II.	vii.	356-47
Historical Footprints in America	II.	ix.	289-316
Higher Education for Women	II.	xii.	308-20
The Genius of Scott	II.	xiii.	341-47
Alexander Gordon the Antiquary	II.	xiv.	9-37,
		xv.	122-44

JURISPRUDENCE AND LAW (See also History and Psychology.)

O'SULLIVAN (D. A.)—Jurisprudence of Insanity	III.	v.	44-55
PROUDFOOT (HON. W.)—Some Effects of Christianity on Legislation.	IV.	ii.	159-75
RAE (G. M.)—Should the Privilege of Making Wills be Restricted	III.	vi.	43
WILSON (SIR DANIEL).—The Law of Copyright	II.	xii.	415-29

LINGUISTICS (See also Archæology, Classical Philology, Ethnology and History.)

ASSIKINACK (F.)—(A Warrior of the Odahwahs) The Odahwah Indian Language	II.	iii.	481-85
		v.	182-86
BROWNING (T. B.)—Elocutionary Drill Chart. *(Ill.)*	III.	vi.	181-211
BURNFIELD (REV. GEO.)—Ancient Egyptian Language	III.	iii.	281-92
CAMPBELL REV. PROF.)—Siberian Inscriptions. *(Ill.)*	IV.	ii.	261-83
The Horites	II.	xiii.	510-45
The Shepherd Kings of Egypt	II.	xiv.	158-207
			219-78
The Eastern Origin of the Celts	II.	xv.	73-91
			277-327
The Affiliation of the Algonquin Languages	III.	i.	15-53
Asiatic Tribes in North America	III.	i.	171-206
The Khitan Languages; the Aztec and its Relations	III.	ii.	158-80
Some Laws of Phonetic Change in the Khitan Language	III.	i.	282-99
CHAMBERLAIN (A. F.)—Relationship of the American Languages	III.	v.	57-76
The Eskimo Race and Language	III.	vi.	8-10
			261-337
The Catawba Language	III.	vi.	25-6
The Mississagua Language. (*Tit.*)	III.	vi.	46
Grammatical Gender	III.	vii.	216-17
Language of the Misaissaguas of Lake Scugog	III.	vii.	213-15
CUMMING (W. H.)—On the Amoy Colloquial Dialect	II.	xi.	81-95
DUNLOP (J. CUNNINGHAM).—The Quichua Language	III.	v.	130-32
FERGUSON (REV. PROF.)—The Etruscan Question	III.	v.	84-105
GEIKIE (REV. A. C.)—Canadian English	II.	ii.	344-55
HALE (HORATIO).—Development of Language	III.	vi.	43, 92-134

	SERIES.	VOL.	PAGE.
HOUSTON (WM.)—Old English Spelling and Pronunciation	III.	ii.	219
The Science of English	III.	vii.	5
Phonetic Spelling	III.	iv.	188
KELLOGG (REV. DR. S. H.)—Modern Hindi as related to the Sanskrit and Prakrit	III.	vii.	4
MACLEAN (REV. JOHN).—Indian Languages and Literature in Manitoba, North-West Territories and British Columbia	III.	v.	215-18
MCNISH (REV. DR. N.)—Language and Literature of Brittany	III.	v.	76-84
Umbria Capta	III.	v.	219-40
The Gaelic Topography of Wales and the Isle of Man	III.	ii.	181-93
A Topographical Argument in Favour of the Early Settlement of the British Isles by Celts	III.	i.	310-31
The Sean Dana	III.	vii.	31
The Gaelic Topography of Damnonia	III.	iii.	43-57
Surnames and Place-Names of the Isle of Man	IV.	ii.	103-12
MORICE (REV. A. G., O.M.I.)—The Déné Languages	IV.	i.	170-212
ORONHYATEKHA.—The Mohawk Language	II.	x.	182-94
		xv.	1-12
ROUSE (M. L.)—On the Number, Nature and Musical Character of Vowel Sounds	III.	iii.	58-9
Analogy Between Consonants and Musical Instruments	III.	iv.	92-4
SCADDING (REV. DR.)—A Note on the Etymon of Ontario	II.	vii.	502-8
Phonetic Anomalies Observed in some Modern Forms of Ancient Proper Names	II.	viii.	329-41
SPENCE (DAVID).—Peculiarities and External Relations of the Gaelic Language	III.	vi.	45, 238-43
Ossianic Poetry	IV.	i.	216-26
SQUAIR (JNO.)—A Contribution to the Study of the Franco-Canadian Dialect	III.	vi.	161-8
TOUT (CHAS. HILL).—The Study of Language	III.	v.	165-73
VANDERSMISSEN (W. H.)—On the Nature of Roots and Words	II.	xv.	509-30
WILSON (SIR DANIEL).—Vocal Language of Laura Bridgeman	II.	xi.	113-23, 184-6

LITERATURE (See also Archæology, Art and Ethnology.)

MACNISH (REV. N.)—The Poems of Ossian	II.	xiii.	392-402
MEREDITH (E. A.)—Some New Emendations in Shakespeare	III.	i.	381-89
SCADDING (REV. DR.)—On Errata Recepta. II. ix. 137-53, 317-26; x. 31-40, 223-32, 386-406; xi. 45-71.			
On Metonyms, or translated and quasi-translated Proper names	II.	xii.	35-56
Canada in the Bodleian	II.	xii.	370-412
Merton College and Canada	II.	xiii.	453-89
Leaves they have Touched. II. xiv. 73-124, 315-47, 479-502, 597-634; xv. 145-60, 531-45.			
Early Gazetteer and Map Literature of Western Canada	II.	xv.	23-45
Canadian Noms-de-Plume Identified	II.	xv.	259-76, 332-48, 436-58
SMITH (GOLDWIN).—The Lamps of Fiction (an address)	II.	xiii.	347-51
WILSON (PROF. DANIEL).—Some Associations of the Canadian and English Maple	I.	iii.	380
Early Notices of the Beaver	II.	iv.	359-87
American Literary Forgeries	II.	xii.	134-48
Ricardus Corinensis	II.	xii.	177-206

MATHEMATICS AND PHYSICS.

	Series.	Vol.	Page.
BAKER (ALFRED).—Experiments in Connexion with the Doctrine of Probability	III.	v.	194-97
CHERRIMAN (J. BRADFORD.)—On the Atmospheric Phenomena of Light	I.	i.	6-8, 25-8
Notes on Poinsot's Memoir on Rotation	II.	viii.	283-6
On Linear Asymptotes in Algebraic Curves	II.	viii.	290-91
On a Reduction of Curves of the Second Order	II.	viii.	291-94
Notes on Trilinears	II.	x.	334-9, II., ix., 249-53; xi., 388-92.
Note on Guldin's Properties	II.	viii.	33-35
On the Reduction of the General Equation of the Second Degree in Plane Co-ordinate Geometry	II.	i.	286-95
Note on the Composition of Parallel Rotations	II.	ii.	92-6
CLARK (J. M.)—Some Thoughts on Thermotics	III.	ii.	36-49
FESSENDEN (C.)—A New Planimeter	III.	v.	27-9
GALBRAITH (JNO.)—On the Conservation of Energy and the Nature of Force	II.	xv.	491-508
KENDALL (REV. E. K.)—Note on Euclid Bk. I., prop. v	II.	iii.	318-20
Remarks on the Negative Index of a Function	II.	viii.	273-77
KINGSTON (G. T.)—Co-efficients of Magnets	II.	viii.	280-83
LANGTON (JOHN).—On a Small Capillary Wave not hitherto Described.	II.	ii.	96-102
LIVINGSTONE (J. A.)—New Discoveries in Gravitation and its Correlations	III.	iii.	275
LOUDON (PROF. JAS.)—Notes on Mechanics	II.	xiv.	354-55
Notes on Statics	II.	xiii.	231-33, 546-50
On the Stability of Floating Bodies	II.	xiii.	135
On Trilinear Co-ordinates	II.	xiii.	62-5
Notes on Relative Motion	III.	i.	231-5
Euler's Equations of Motion	III.	i.	95-6
Geometrical Methods, chiefly in the Theory of Thick lenses.	III.	iii.	18-21
The Spherical Aberration of Mirrors	III.	iii.	87
LOUDON (W. J.)—The Radiometer. (*Tit.*)	III.	ii.	221
MACFARLANE (ALEX.)—Notation for Physical Units	III.	iii.	81-86
MARTIN (J. W.)—Geometric Problems relating to Curves	II.	v.	331-2
Remarks on some General Properties of Curves	II.	viii.	278-9
NOBLE (CAPT. A.)—Value of the Factor in Hygrometric Formulae	II.	i.	24-6
ROSEBRUGH (DR. A. M.)—Duplex Telephony. (*Ill.*)	III.	v.	106-11
Telegraphing to and from Railway Trains	III.	iv.	177-80
ROSEBRUGH (T. R.)—New Trigonometrical Scale	III.	vii.	32
SCADDING (REV. DR.)—Phototypography	II.	xv.	574-600
YOUNG (REV. PROF. G. P.)—A New Proof of the Parallelogram of Forces	II.	i.	257-9
On Sir David Brewster's Supposed Law of Visible Direction	II.	ii.	268-76
A New Proof of the Existence of the Roots of Equations.	II.	ix.	26-7
Relation of the Law of Gravitation to the Principle of the Conservation of Energy	II.	xiv.	589-96
Principles of the Solution of Equations of the Higher Degrees, with Applications	III.	ii.	79-126
Resolution of Solvable Equations of the Fifth Degree	III.	ii.	127-41

	SERIES.	VOL.	PAGE.
YOUNG (REV. PROF. G. P.)—Solutions of Equations of the Fifth Degree	III.	iii.	7
An Examination of Legendre's Proof of the Properties of Parallel Lines	II.	i.	519-22
Resolution of Algebraical Equations	II.	v.	20-41, 127-67
YOUNG (REV. PRO. G. P.)—Relation between the Area of a Triangle and the sum of the Angles	II.	v.	341-58
Formulae for the Cosines and Sines of Multiple Arcs	II.	viii.	286-9
The Real Correspondence of Imaginary Points. (*Tit.*)	III.	ii.	157

MEDICINE.

AGNEW (J. N.)—State of Medical Science in Ontario	II.	xii.	207-217
ARMSTRONG (CH.)—A Case of Mesmerism	III.	vii.	12-13
BRYCE (DR. P. H.)—Diphtheria and Scarletina in their Various Aspects. (Report for 1886 of Ontario Provincial Board of Health.) (*Tit.*)	III.	v.	149
Hypnotism and its Phenomena	III.	ii.	61-77
Some Factors in the Malaria Problem	III.	ii.	216-18
CANNIFF (DR. W.)—The Value of Sanitation. (*Tit.*)	III.	vii.	36
DADE (REV. C.)—Notes on the Cholera Seasons of 1832-34	II.	vii.	17-28
ELLIS (DR. W. H.)—Milk Analysis and Milk Standards	III.	vii.	25-26
GARNIER (DR. J. H.)—Snake Poisons	III.	v.	255-61
HALL (DR. C. B.)—On the Vagaries of Medicine	II.	xi.	225-33
NESBITT (DR. W. B.)—Volumetric System in Materia Medica	III.	v.	163-65
ROSEBRUGH (DR. A. M.)—Photographing the living *Fundus Oculi.* (*Tit.*)	III.	v.	192
A New Ophthalmoscope	II.	ix.	81-92
The Optical Defects of the Eye and their Treatment by the Scientific Use of Spectacles. (*Ill.*)	II.	xi.	1-31
Electro-Therapeutic Apparatus	III.	vi.	14-16
RYERSON (DR. G. S.)—The Influence of Tobacco and Alcohol on Vision	III.	vi.	18-19
Colour Blindness	III.	vii.	20-21
TEMPEST (W., M.B.)—The Abortive Treatment of Cholera	II.	xi.	163-78
WRIGHT (PROF. R. R.)—Germ Theory of Disease (Synopsis of a Lecture)	III.	i.	344-50
Recent French Investigations in Hypnotism	III.	vi.	10-13

POLITICAL ECONOMY (Including Sociology and Statistics).

ANON.—Statistics of Upper Canada	I.	ii.	285-6
BROWNING (T. B.)—Individualism from a Social and Historic Point of View	III.	vi.	21-2
CHERRIMAN (J. B.)—On the Provincial Currency	I.	i.	177-80
DOUGLAS (W. A.)—Wages	III.	iii.	39-40
Rent, a criticism	III.	iv.	58-9
Wealth and its Measurement	III.	vii.	7-8
Antagonism of Social Forces	III.	v.	136-41
The Study of Economics	III.	vi.	27-8
FLEMING (SANDFORD, C.M.G., LL.D.)—Electoral Representation	IV.	ii.	315-31
An appeal to the Canadian Institute on the rectification of Parliament. (Published as separate pamphlet of 177 pp. 1892)			

	Series.	Vol.	Page.
GEIKIE (REV. A. C.)—Notes on the Population of New England	II.	i.	245-51
HENNING (THOMAS.)—Applicability of our Educational System to the Social Condition of Large Cities	II.	iii.	422-37
HINCKS (REV. PROF. W.)—On the True Claims to Attention of the Science of Political Economy	II.	vi.	20-28
An Inquiry into the Natural Laws which Regulate the Interchange of Commodities	II.	vii.	180-90
Notes on Economic Science	II.	xi.	96-113
HOUSTON (WM.)—Scientific Aspect of the Henry George Movement	III.	vi.	33-38
The Village Community in Modern Politics	III.	iv.	61-66
Relation between Political Science and Practical Politics	III.	vi.	40-42
Scientific and Pedagogic Claims of Sociology	III.	v.	25-6
KELSO (J. J.)—Necessity of a Society for the Prevention of cruelty to Animals in Toronto	III.	v.	142-3
MEREDITH (DR. E. A.)—Compulsory Education in Crime	III.	ii.	23c-31
Influence of Recent Gold Discoveries on Prices	II.	i.	430-46
LEVEY (CHAS.)—Capital	III.	vi.	29-30
LIVINGSTONE.—Convertible Securities. (*Tit.*)	III.	iv.	147
ROSEBRUGH (DR. A. M.)—Prison Reform	III.	vii.	22,206-12
LANGTON (JOHN).—The Census of 1861	II.	x.	1-19
MACDOUGALL (ALAN).—Canadian Cattle Trade and Abattoirs	III.	ii.	53-61
MASON (J. HERBERT).—Transfer of Land	III.	ii.	34
O'SULLIVAN (D. A.)—Our Federal Union	III.	ii.	29-33
Systematic Charity	III.	iii.	101-8

PSYCHOLOGY.

CREELMAN (W. F. W.)—Relations between Physiology and Psychology	III.	v.	14-20
HINCKS (REV. PROF. WM.)—The Sensationalist Philosophy	II.	iv.	396-406
An attempt at a New Theory of Human Emotions	II.	vii.	103-8
Thoughts on Belief and Evidence	II.	x.	232-46
INGLIS (REV. D.)—On the Relation of Quantity to the Æsthetic Sentiment	II.	iii.	409-14
JOHNSON (A. S.)—The Law of Habit	III.	iv.	26-56
MURRAY (REV. J. C.)—Sir Wm. Hamilton's Philosophy	II.	xi.	207-24
300-319, 367-388; xii. 57-85.			
WILSON (PROF. DANIEL)—Left-handedness. (*Ill.*)	II.	xv.	465-85
YOUNG (REV. PROF. G. P.)—An Examination of Prof. Ferrier's Theory of Knowing and Being	II.	i.	105
Notes on Passages in the Platonic Dialogues	II.	vii.	477-83
Prof. Boole's Mathematical Theory of the Laws of Thought.	II.	x.	161-82

MISCELLANEOUS.

FITZGERALD (GERALD).—Miracles. (*Tit.*)	III.	vi.	39
HENRY (PROF.)—The Lecture Room, Smithsonian Institute. (*Ill.*)	I.	ii.	130
	II.	iii.	110-15
NOTMAN (JOHN).—The Manufacture of Paper	III.	v.	197-203
SCADDING (REV. DR.)—On Accidental Discoveries	I.	i.	207
On Museums as Instruments of Education	II.	xiii.	1-25
SULLIVAN (DION C.)—Fortuitous Events. (*Tit.*)	III.	v.	193

APPENDIX (Addresses of the Presidents of the Canadian Institute.)

LEFROY (CAPT., Afterwards General Sir J. Henry).—On the affairs of the Institute	I.	i.	121-3

	SERIES.	VOL.	PAGE.
ROBINSON (SIR. J. BEVERLEY).—The Condition, Object and Prospects of the Canadian Institute	I.	ii.	142-6
Considerations respecting the condition and prospects of the Canadian Institute	I.	iii.	153-5
ALLAN (GEO. WM., M.L.C.)—The present condition and future prospects of the Institute, with a review of its past history.	II.	i.	97-104
DRAPER (HON. C. J., C.B.)—Observations on the scientific progress of the day	II.	ii.	81-92
Observations on the work of the Institute and of the Toronto Observatory	II.	iii.	97-107
ALLAN (HON. G. W.)—The progress of discovery in the regions of science	II.	iv.	85-96
WILSON (DANIEL, LL.D.)—On the enlargement of the sphere of knowledge	II.	v.	109-127
A review of the recent progress of knowledge	II.	vi.	101-20
HAGARTY (HON. J. H., D.C.L.)—On the relation between Science and Theology	II.	vii.	1-16
McCAUL (REV. JOHN, LL.D.)—Review of the progress of human knowledge during the year 1862	II.	viii.	97-111
MOWAT (HON. OLIVER, V. C.)—Observations on science suggested by contemporary events	II.	x.	81-95
HINCKS (REV. WM., F.L.S.)—Thoughts on the nature, utility, proper aims and modes of operation of scientific societies	II.	xii.	97-107
LOUDON (JAS. M.A.)—On the advancement of science	II.	xv.	365-80
BUCHAN (J. M., M.A.)—Remarks on the relation between progress in physical science and progress in other departments of thought and action	III.	i.	361-80
On complexion, climate and race	III.	ii.	22-38
ELLIS (PROF. W. H., M.A., M.B.)—On the development, aims and functions of learned societies	III.	ii.	22-38
VANDERSMISSEN (W. H., M.A.)—Claims of science and work of the Institute	III.	v.	2-12
HARVEY (ARTHUR, ESQ.)—A critical review of the enterprise of Christopher Columbus. *(Tit.)*	IV.	iii.	5

LIST OF MEMBERS

OF

THE CANADIAN INSTITUTE.

JULY, 1893.

HONORARY MEMBERS.

Chapman, Prof. E. J., Ph. D., University College.....Toronto.
Cumming, W. H., M.D .....Atlanta, Georgia, U.S.A
Fleming, Sandford. C.E., LL.D., C.M.G .....Ottawa, Ont.
Koss, Hon. G.W., LL.D..... .....Toronto, Ont.
Tully, Kivas, C.E.. ..... "
Workman, Joseph, M.D..... ..... "

LIFE MEMBERS.

Browning, T. B., M.A .....London, England.
Broadhead, Hon. J. G .....Washington, D.C.
Chewett, W. C., M.D..... .....York Township, Ont.
Forster, J. W. L .....Toronto.
MacNish, Rev. Neil, D.D., LL.D ....Cornwall, Ont.
Murray, George..... .....Churchville, Ont.
Rosebrugh, A. M., M.D ....Toronto.
Scadding, Rev. Henry, D.D ..... "
Smith, L. W., Q.C., D.C.L .... "

CORRESPONDING MEMBERS.

Beeman, T. W., M.D..... .....Perth, Ont.
Haliburton, R. G., Q.C., F.R.G.S.....London, England.
Morice, Rev. A. G., O.M.I..... .....Stuart's Lake, B.C.
Walker, Eden, M.D..... .....New Westminster, B.C

ORDINARY MEMBERS.

Abrey, G. B., C.E..... ...Toronto.
Adams, E. Herbert, M. D ..... "
Ahn, R. H .... "
Allan, Hon. Senator .....Toronto.
Allen, S. R ..... "
Ames, J. H..... ..... "

Armstrong, Charles ..... Toronto.
Armstrong, C. W..... "
Armstrong, T. C. L., M.A., LL.B. "
Arnoldi, Frank..... "

BAIN, JAMES, Jun., Treasurer..... "
Baldwin, R. R., B.A..... "
Barnett, J. Davies..... Stratford, Ont.
Beadle, Delos W., M.A., LL.B.... Toronto.
Beaty, James, Jun., Q.C., D.C.L... "
Bell, Prof. A. J., M.A., Ph. D..... "
Bertram, John..... "
Bethune, R H ..... "
Bethune, Rev. C. J. S., D.C.L... Port Hope
Blain, Hugh ..... Toronto.
Blake, W. H..... "
Blue, Archibald..... "
Boultbee, W., C.E..... "
Bowes, Robert H ..... "
Boyd, Alfred..... "
BOYLE, DAVID. Ph. B., Curator..... "
Brooke, D. O..... "
Brouse, W. H..... "
Brown, Hubert..... "
Bryce, P. H., M.A., M.D. ..... "
Burgess, Thos. J. W., M.D... Montreal Que.

Cameron, Mrs. A. ..... Toronto.
Cameron, Prof. I. H., M.D..... "
Campbell, Paul ..... "
Campbell, Rev. Prof., LL.D., Montreal, Que.
Canniff, W., M.D ..... Toronto.
Carpmael, Charles. M.A., F.R.
A.S., F.R.S.C..... "
Cassels, Allan, B.A ..... "
Caston Henry E ..... "
Chamberlain, A.F., M.A., Ph.D., Worcester, Mass. U.S.A.
Chase, G. A., B.A..... Toronto.
Child, W. A., Ph.B., M.A..... "
Christie, William ..... "
Clark, Prof. Daniel, M.D..... "
Clark, J. M., M.A..... "
Clark, L. J ..... "
Clendenan, D. W..... Toronto Junction.
Clougher, T. R..... Toronto.
Coatsworth, E., M.P. ..... "
Coleman, Prof. A. P., Ph.D..... "
Copp, W .W..... "
Cox, Arthur..... "
Coyne, J. H., B.A..... St. Thomas, Ont.
Cruikshank, E. A..... Fort Erie, Ont.

Davidson, John I ..... Toronto.
Dewar, R..... Toronto.
Dick, David B ..... "
Donald, R. A ..... "
Douglass, W. A., B.A..... "
Duggan, E. H..... "

Elliot, R. W. ..... "
Ellis, Prof. W. H., M.A, M.B..... "
Elvins, Andrew ..... "

Fairclough, H. R., M.A..... "
Ferguson, Rev. Prof. B.A., Queen's College..... Kingston, Ont.
Fisken, J. Kerr, B.A..... Toronto.
Foy, J. J ..... "
Fraser, W. H., M.A..... "

Galbraith, Prof. J., M.A..... "
Gibson, Thomas W..... "
Gilchrist, A. W ..... Toronto Junction.
Goldie, James ..... Guelph, Ont.
Gzowski, Col. Sir. C. S., A.D.C.... Toronto.
Gzowski, C. S. jun..... "

Haldane, William..... "
Hale, Horatio..... Clinton, Ont.
Hamilton A., M.D ..... Toronto.
HAMILTON, J. C., M.A., LL.B., 1st. Vice President ..... "
Hare, Rev. Prof. J. J. Ph.D .... Whitby Ont
Hart, Milner..... Toronto.
Harvey, Arthur ..... "
Hawke, Widmer..... "
Heys, T..... "
Hirschfelder, C. A..... "
Hodgins, Thomas, M.A., Q.C..... "
Hollingworth, S ..... "
Horning, Prof. L. C., Ph.D. ..... "
Houston, W., M.A ..... "
Howard, A. McLean..... "
Howell, H. S..... Galt.
Howland, O. A..... Toronto.
Hoyles, A. L..... "
Hughes, B. B ..... "
Hume, Prof. J. G., M.A., Ph.D., University College ..... "
Hunt, Henry, M.D ..... "
Hunter A. F., B. A..... Barrie, Ont
Hutchison, Henry..... Toronto.
Hutton, Prof. M., M.A., University College..... "

Ince, T. H., D.C.L..... "
Ives, J. T. B., F.G.S., Philadelphia, U.S.A.

Jacobs, P ..... Toronto.
James, Charles C. ..... "
Jenkins, R ..... "
Jennings, W. T., M. Inst. C. E. .... "
Joyce, R. P. B. ..... "

KENNEDY, GEORGE, M.A., LL.D., Editor ..... "
Ker, William ..... Brantford, Ont.
KEYS, D. R., M.A., Librarian ..... Toronto.
Klotz., Otto, D.T.S. ..... Ottawa, Ont.
Knowlton, W. H .... Toronto.

Laboureau, Rev. Father ..... Penetanguishene, Ont.
Laidlaw, G. E ....Victoria Road, Ont
Lamb, Daniel ..... Toronto.
Lander. J. C ..... "
Langton, H. H., B.A. ..... "
Langton, John, M.A ..... "
Langton, Thomas, M.A., Q.C. .... "
Latimer, Rev. J. F. ..... "
Laughlin, Arthur .... "
Laughlin, J. S. ..... "
Lefroy, E. B. ..... "
Lindsey, Charles ..... "
Locke, James T ..... "
Loudon, President J., M.A., University College ..... "
Lumsden, George E ..... "

Macallum, Prof. A. B., B.A., M.B., Ph.D. ..... "
Macdonald, J. K. ..... "
MACDOUGALL, ALAN, M.Inst.C.E., Secretary ..... "
Macfarlane. A., D. Sc., F.R.S.E. Prof. University of Texas ... Austin, Texas.
Mackenzie, J. J., B.A ..... Toronto.
Maclennan, Hon. Justice ..... "
Marcon, W. H. ..... "
Martin, T. Mower, R.C.A. ..... "
Mason, J. Herbert ..... "
Maughan, John. Sr .... "
Maughan, John, Jr. ..... "
Mavor, Prof. J. University College .. "
McAree, John, P.L.S., C.E ..... "
McAllister, S .... "
McCrosson, T ..... Penetanguishene, Ont.
McEvoy, J. M., B.A. ..... Toronto.
McGill, Anthony, B.A. ..... Ottawa, Ont.
McInnes, A. .... Toronto.
McLean, Rev. John, M.A., Ph.D., Port Arthur, Ont.
McMaster, Captain W. F. ..... Toronto.
McNally, P. J. .... "
McPherson, W. D .... "
Meek, Edward ..... "
Meredith, E. A., M.A., LL.D. ..... "
Merritt, W. H.. F.G.S ..... "
Mickle, G., B.A. ..... Sudbury, Ont.
Middleton, Lancelot, C.E. ..... Ottawa, Ont.
Middleton, W. E. ..... Toronto.
Mills, S. D. New Birmingham, Texas, U.S.A.
Morton, J. A. .... Toronto.
Mowat, Sir Oliver, Q.C., Attorney-General .... "
Murphy, J. J. ..... "
Musson George, Jr. ..... "
Mutton, W. George .... "

Nairn, Alexander ..... "
Nairn, John ..... Winnipeg, Man.
Needler, G. H., B.A., Ph.D. ..... Toronto.
Nevitt, R. B., M.D .... "
Nichol, Rev. R. T. ..... New York, U.S.A.
Noble, James ..... Toronto.

Oronhyatekha, M.D. ..... Toronto.
Orr, R. B., M.D. ..... "
Osborne, A. C ..... North Bay, Ont.
Osler, E. B ..... Toronto.

Palmer, L. L., M.D ..... "
Patrick, Thomas A., M.D. .Saltcoats, Assa.
Pattinson, George .... Preston. Ont.
Payne, F. F. .... Toronto.
Pearce, W. ..... Calgary, N.W.T.
Pepler, F. E. P., Q.C. .. . .Barrie, Ont.
Pike, Prof. W. H., M.A., Ph.D., University College ..... Toronto.
Primrose, A., M.B. ..... "
Proudfoot, Hon. W. ..... "
Pursey, G. G. ..... "

Rae, G. Martin. ..... "
Reeve, Prof. R. A., M.D. ..... "
Richardson, Prof. Jas. H., M.D. .... "
Ridout, J. G. ..... "
Rippon, E. V ..... "
Ritchie, George, B.A., B.Sc ..... "
Robertson, Thomas ..... "
Robinson, J., M.D. ..... "
Robinson, Hon. J. B. ..... "
Rust, C. H., M. Can. Soc. C E .... "
Rutherford, Andrew. ..... "
Rutherford, Walter, M ..... "
Ryerson, G. S., M.D., M.P.P. ..... "

Sherwood, W. A ..... Toronto.
Shortiss, T., M.E..... "
Shutt, Prof. F. T., M.A., F.C.S .... Ottawa.
Smith, Prof. A..... Toronto.
Smith, G. B., M.D. ..... "
Smoke, S. C., M.A..... "
Sparling, Charles P..... "
Speight, T. B., P.L.S..... ... "
Spence, Robert W ..... "
Spotton, H. B., M.A ..... "
Squair, Prof. John, B.A ..... "
Stewart, Louis B., C.E ..... "
Stupart, Capt. D., R.N .... "
Stupart, R. F ..... "

Talbot, D. H ..... Sioux City, Ia., U.S.A.
Tyrrell, J.B., M.A., B.Sc., F.G.S., Ottawa.

Van der Smissen, W. H., M.A..... Toronto.

Wade, Henry..... Toronto.
Wadsworth, V. B..... "
WALKER, B. E., 2nd. Vice President. "
Watson, Rev. D., D.D ..... Beaverton Ont.
Weaver, H. D ..... Toronto.
Wilgress, G. S., B.A..... Huntsville, Ont.
Wilkes, Miss Marcella ..... Toronto.
Williams, George..... "
Williams, J. B ..... "
Willmott, Arthur B., M.A..... "
Wilson, G. H..... "
Wilson, R. N..... ...Macleod, Alta.
Wood, H. R., B.A. Missoula, Montana, U.S.A.
WRIGHT, PROF. R. RAMSAY, M.A., B.Sc., University College, President ..... Toronto.
Wyld, Frederick..... "

Young, John..... Enniskillen, Ont.

ASSOCIATE MEMBERS.

Allen, Joseph Antisell..... Kingston, Ont.
Fleming, F. A ..... Toronto, Ont.
Flood, Miss Sarah A..... "
Harrington, Miss Lilian C..... "
Keefer, C. H., C.E..... "
Lynge, Edward ..... "
McCraken, Thomas ..... "
Miller, Charles P..... "
Morrison, W. ..... "
Piper, H. L..... "
Powell, G. K. ..... "
Samuelson, S. L ..... "
Shoults, Miss Bertha M..... "
Spry, W., C.E..... "
Vincent, Robert P ..... "

JUNIOR MEMBERS.

Carlile, Arthur S ..... Toronto, Ont.
Champ, H. C..... "
Currelley, Charles T ..... "
Dent, C. Reade..... "
Ellis, Carlisle..... "
Fleming, James H ..... "
Harvey, C. H ..... "
Hill, Clarence..... "
Lochead, Cameron ..... "
Maybee, J. E..... "
Quarrington, Walter..... "

TRANSACTIONS

OF

THE CANADIAN INSTITUTE.

VOLUME IV., 1892-93.

TORONTO:

PRINTED FOR THE CANADIAN INSTITUTE,

BY THE COPP, CLARK COMPANY, LTD., COLBORNE ST.

1895.

OFFICERS

OF

THE CANADIAN INSTITUTE,

1892-1893.

President:
ARTHUR HARVEY, Esq.

Vice-President:
A. B. MACALLUM, Ph.D., M.B.

Secretary - - - - - ALAN MACDOUGALL, M. Can. Soc. C.E.
Treasurer - - - - - JAMES BAIN, Jr., Esq.
Librarian - - - - - D. R. KEYS, M.A.
Curator - - - - - DAVID BOYLE, Ph.B.
Editor - - - - - GEORGE KENNEDY, M.A., LL.D.

Members of Council:

O. A. HOWLAND, Esq.
L. J. CLARK, Esq.
A. BLUE, Esq.
JAMES H. PEARCE, Esq.
JOHN MAUGHAN, Esq., *Chairman of the Biological Section.*
J. B. WILLIAMS, Esq., *Secretary* " "
J. C. HAMILTON, LL.B., *Chairman of the Historical Section.*
B. E. WALKER, Esq., *Chairman of the Geological and Mining Section.*

Assistant Secretary and Librarian:

R. W. YOUNG, M.A.

CONTENTS.

PAGE

Officers, 1892-93 iii

Notes on the Western Dénés 1
REV. A. G. MORICE, O.M.I.

Transactions—Session 1892-93 223

Forty-Fourth Annual Meeting 244

Forty Fourth Annual Report 245

Social Organization of the Blackfoot Indians 249
REV. JOHN MACLEAN, M.A., PH.D.

A New Reading of the Buddhist Inscriptions of India (Plates I., II., III., IV.).. 261
REV. JOHN CAMPBELL, LL.D.

The Journal of Captain Walter Butler on a Voyage along the North Shore of Lake Ontario, from the 8th to the 16th of March, 1779 279
CAPT. ERNEST CRUIKSHANK.

Memoir of Captain Walter Butler 284
CAPT. ERNEST CRUIKSHANK.

Early Traders and Trade Routes, 1760-1782. (Second Paper) 299
CAPT. ERNEST CRUIKSHANK.

Note on a Memorable Epoch in Canadian History 314
SANDFORD FLEMING, LL.D., C.M.G.

The Present Aspect of the Ossianic Controversy 319
REV. NEIL MACNISH, B.D., LL.D.

Niagara Library, 1800-1820 336
JANET CARNOCHAN.

Notes on the History of the Amalgamation Process 357
ROBERT DEWAR.

[The Editor is requested to state that the specimen of *Pinicola Enucleator* mentioned in Vol. I., page 41, No. 7, was captured by Mr. E. E. Thompson.]

TRANSACTIONS

OF

THE CANADIAN INSTITUTE,

SESSION 1892-93.

NOTES

ARCHÆOLOGICAL, INDUSTRIAL AND SOCIOLOGICAL,

ON THE

WESTERN DÉNÉS

WITH AN ETHNOGRAPHICAL SKETCH OF THE SAME

BY THE REV. FATHER A. G. MORICE, O.M.I.

Read 4th November, 1893.

CONTENTS.

PAGE

Introduction 5

CHAPTER I.

Ethnological Sketch 8
The Name "Déné" 8
Distribution of the Dénés 10
Main Characteristics of the Déné Race 17
Distribution of the Western Dénés 22

CHAPTER II.

Preliminaries 32
Philological 32
Works and Implements Unknown Among the Western Dénés 35

CHAPTER III.

Stone Implements 39
Industrial Stone Implements 43
Stone Weapons of War and of the Chase 53

CHAPTER IV.

Bone and Horn Implements 66

CHAPTER V.

Traps and Snares 84
Fish Traps 84
Land Animal Traps 93
Snares 98
Observances of the Hunter and Trapper 106

CHAPTER VI.

Wooden Implements 111

CHAPTER VII.

Bark Implements 120
Esculent and Medicinal Plants 127
Other Bark Implements 132

Canadian Dept 10-15-06

CHAPTER VIII.

Copper and Iron Implements... 136
Copper Implements..... 136
Iron Implements..... 140

CHAPTER IX.

Skin Objects, and Twined and Textile Fabrics.. 145
Skin Objects 145
Objects of Mixed Material 150
Textile and Twined Fabrics..... 156

CHAPTER X.

Dress and Personal Adornment..... 162
Common Dress..... 162
Ceremonial Costume 172

CHAPTER XI.

Habitations 184

CHAPTER XII.

Monuments and Pictography..... 199
Carved Monuments 199
Pictography..... 206
Index..... 213
Works quoted or referred to 219
Addenda et Corrigenda 221

INTRODUCTION.

"Archæological" is rather inappropriate in connection with the present monograph, whose scope embraces nothing archæan or really ancient. The prehistoric Dénés are the Dénés of but yesterday. For, what are the one hundred years which have elapsed since the discovery of their country compared with the twenty or more centuries which separate us from the famous civilizations of ancient Egypt and Assyria? Yet, to check possibly too sanguine expectations from such archæologists as may happen to read these lines, I hasten to declare that it is perhaps more easy to present the lover of technological lore with graphic illustrations of the arts and industries which flourished among the subjects of the Pharaohs and the Assyrian monarchs, than to thoroughly illustrate from actual specimens the *ensemble* of the arms, working implements, household utensils and ceremonial paraphernalia, which should concur in reconstructing the peculiar mode of life pursued by the primitive Dénés. The original Egyptians and Assyrians have left us, besides authentic records of their own doings on imperishable material what promises to prove well nigh unlimited stores of practical illustrations of their past sociology in their tombs, their temples and other public monuments. So that the antiquarian's task is greatly facilitated by the abundance of the material at his command. Furthermore, where the hieroglyphic and cuneiform chronicles fail to clear up difficulties of interpretation or to enlighten him on the particular use of ancient implements, he has only to delve into Herodotus and other historians for the desired light.

Not so, however, with regard to the prehistoric Dénés. As I have elsewhere demonstrated,* that family of American aborigines, and more especially the Carrier tribe to which prominence will be given in the following pages, is characterized by a wonderful power of imitation and self-adaptation which prompted it, upon the advent of the whites, to discard most of its native customs, indigenous weapons and working implements. As a natural consequence, many of the latter are now in a fair way towards complete obliteration. Moreover, the nation's historians, I mean the old men who witnessed the manufacture and use of some archæological articles the duplicates of which have caused speculations from more than one antiquarian, are fast disappearing from

* "Are the Carrier Sociology and Mythology Indigenous or Exotic?" Trans. Roy. Soc. Canada, Section II. 1892.

the scene of this world. So that the sooner the Déné technology is brought to light, the better it will be in the interest of science.

Indeed, should any value whatever be attached to the present monograph, I feel quite certain that it will be entirely on account of its opportuneness. Undertaken twenty-five years ago, it could probably have been made more exhaustive. After the lapse of an equal space of time, its usefulness as a contribution to archæological knowledge would be problematical. I am at present the possessor of the only remaining specimens of some objects illustrative of the past Carrier sociology, and my familiarity with the language and original customs of the Indians to whose spiritual wants I minister, might not be enjoyed by a successor among them until time and circumstances deprive its use of much of its value.

These considerations, corroborated by the requests of scientists whose advice I have not the right to disregard, have emboldened me to attempt a description of such technological objects as can be illustrated from specimens in my possession or which are still in common use among the Western Dénés. The number of these, as will soon appear, is somewhat limited, and therefore my task cannot be very arduous. I only regret that my mineralogical shortcomings render an exact description of the material used in the fabrication of stone implements in a few cases impossible. For the identification of such rocks as are adequately described, I am under obligation to Dr. G. M. Dawson, Assistant Director of the Geological Survey of Canada, Ottawa.

As technology is the prime object of this monograph, the industries of the Western Dénés will be mentioned in so far only as may be necessary for the clear understanding of the nature and use of the objects therein described. Which statement should not convey the idea that I intend to make light of their claims to importance in an ethnological contribution. With a little reflection, it will become apparent that all human industries need material aids or means to manifest themselves, and their results must also take a concrete form. Now, these palpable data, be they the products of human ingenuity or the instruments employed in their development, are *per se* technological items, and by reviewing the latter, one cannot help treating of the former. Therefore I simply mean to say that the archæological, rather than the industrial, plan will be adopted in the following pages. In other words, our divisions shall be based, not on the industries of the Western Dénés, but, as far as practical, on the material of the weapons, tools, utensils, fishing devices and other implements under consideration.

As for the third, or sociological scope of this paper, I think that our title will be justified not only by numerous transient mentions of native customs and practices, but more especially by extended descriptions of the Aborigines' usages and superstitions in connection with fishing and trapping, their domestic economy as regards diet and remedies, their ceremonial dress, their habitations, etc. However, for more systematic information concerning the Déné sociology, the reader must be referred to another paper published some years ago under the title of "The Western Dénés ; their Manners and Customs." *

Mythology may be regarded as a mirror wherein the psychological ideas and the particular social institutions and mode of life of a people are faithfully reflected. Therefore I have not deemed it inconsistent with the nature of my subject to intersect the following pages with a few short legends or traditions, especially when these may prove a help towards the formation of a more correct idea of the objects hereafter described.

* Proceedings Can. Inst., vol. vii., p. 109, *et seq.*

CHAPTER I.

ETHNOLOGICAL SKETCH.—THE NAME "DÉNÉ."

For the benefit of such of my readers as may not have seen my former essays, I must repeat that by Dénés I mean that large family of American Aborigines commonly known under the names of Tinné, Tinneh, Tenni (Bompas), Tenne (Kennicot) and Athapaskans. As I have already pointed out elsewhere, all of these appellations are inappropriate. For more reasons than one, they should, in my estimation, be discarded in favour of "Déné." Neither Tinné nor Tinneh have any meaning in the dialect of the many tribes into which that extensive stock is divided. The ethnologists who are responsible for these nicknames gathered them from the desinence of several tribal names probably badly pronounced, and certainly misspelt, by the earliest *voyageurs* or traders who made mention of these Aborigines. The verbal suffix *'Tinne*, or *'Tenne*, is evidently the term they aimed at rendering. Now to the native ear the difference between T and 'T is infinitely greater than is with us that which exists between such letters as W and G, since these are commutable in the Aryan languages,* while the former are not in the Déné dialects. Thus, in Carrier, *ta* means "lip," and *'ta* "feather;" *to* means "up," and *'to* "nest;" *tis* stands for "younger sister," and *'tis* for "coals;" *taz* is the root for "heavy," and *'taz* signifies "backward;" *nəstaih* is equivalent to "I dance," while *'nəs'taih* means "I ripen." These contrasts could be multiplied almost *ad infinitum.*

Furthermore, 'Tinne, being a suffix, cannot stand without its verbal support. Thie would-be noun is composed of the root of the verb *hwos'ten* (or *kwos'tin*, etc., according to the dialect) which means "I inhabit," and the personal plural particle *ne* (or *ni*) resulting in the verbal noun *hwo'tenne* (or *kwo'tinni*, etc.) "inhabitants," which when suffixed to a name of river is contracted into *'tenne*, etc., as in *Naz-Koh-'tenne*, *Tsiǰ-Kch-'tinni.* Thus this pretended word corresponds in every particular—save that in Déné it is a verbal not substantive affix—to the final *-enses* of Lugdunenses, Massilienses, Carthaginienses, Colossenses, etc. Now who ever dreamt of denominating by that final the latin speaking peoples? Who would, for instance, call *Ens* the French nation

* As is evident from the conversion of William into Gulielmus, Guglielmo, Guillermo, Guilherme and Guillaume; of War into Guerre and Guerra, etc.; of Warrant into Garantir, etc.

because it designates as Parisi*ens* the inhabitants of Paris; as Londoni*ens* those of London, etc.? Yet the identity of the two cases is so evident that I need only translate the above, and say London-hwo'tenne, Palî-hwo'tenne, to bring it home to the dullest intellect. As with the *-enses* and the *-ens* of the Italic tongues, so it is with the *'tenne* of the Déné idioms; it never applies but to names of places or at least of ethnographic divisions. Another point of similarity is that it varies with the dialects, being *'tenne* in Carrier, *'tinni* in Tsi|Koh'tin, *'qenne* in Tsé'kéhne, etc.

Lastly the correct pronunciation of these word-endings requires a lingual explosion which cannot be obtained except by those already initiated into the mysteries of the Déné phonetics. Hence the absurdity of designating a whole nation by an accidental suffix, impossible of pronunciation to the great majority of the readers, which is no word of itself and changes according to the dialect of some twenty or more different tribes.

Another name no less widely used to denominate the Déné stock, and for which Gallatin is said to be responsible, is "Athapaskan." Now fancy the propriety of calling the whole British, not merely English, race, say Bristolians or Manchesterians! The Bureau of Ethnology of the Smithsonian Institution which has adopted this name in its official publications has to confess that "it has been objected to by a number of missionaries—students of various dialects of this family in the North-West—but," it is added, "priority demanded that Gallatin's name should be retained."* Methinks, however, that time cannot of itself convert a wrong into a right.

Rev. E. Petitot replaces either vocable by Déné-Dindjié, thereby "uniting in one compound word the southermost tribe, the Chippewayan or Déné, with the northermost, the Loucheux which calls itself Dindjié."† This name, which is undoubtedly a vast improvement on any of the above mentioned, and has the merit of containing two genuine Indian words, correctly spelt, has perhaps the disadvantage of unwittingly contracting in the mind of the reader the area covered by the nation thereby designated. The Chippewayans are *not* the most southerly branch of the family not only on the North American continent, but even within British America. The Tsi|Koh'tin and the Carriers inhabit a stretch of land several degrees of latitude more to the south and are nevertheless territorially connected, without any intervening gap, with all the North-

* Bibliography of the Athapaskan Languages, by J. C. Pilling, p. v.; Washington, 1892.

† *Monographie des Déné-Dindjié*, p. xix.; Paris, Leroux, 1876.

ern Dené tribes. Therefore, on his own basis of word formation, the abbé Petitot should call the whole race Təni-Dindjié,* not Dené-Dindjié.

But we should not overlook the numerous offshoots it has spread out through the Western and Southern States of the American Union, and whose term for "man," and consequently for themselves considered as aborigines, is practically identical with "Dené."† Why then should we not call the whole stock *Dené*, after the native name of the most central—taking into consideration the southern scattered tribes—and one of the most populous branches thereof?‡ We could perhaps find a precedent for this in the names of such European peoples as the Italian, the French and even the English, which came to be given the entire nation after they had long represented one of the most important of its original tribes, the Itali, the Franks and the Angles or Angli.

Despite their minuteness, the foregoing remarks have been deemed necessary since their substance, as embodied in a foot-note to a former paper by the writer does not appear to have received the attention he cannot help thinking it deserved at the hands of Ethnologists. Even the few who have noticed it now seem to labour under the impression that the Dénés are a branch of the Athapaskan family lately made known to the scientific world!§ Such is the force of habit! Others suppose that Tinne and Dené are the same word under two different dialectical forms.‖

DISTRIBUTION OF THE DÉNÉS.

No other aboriginal stock in North America, perhaps not even excepting the Algonquian, covers so great an extent of territory as the Dené. The British Isles, France and Spain, Italy and any two or three of the minor European commonwealths taken together would hardly represent the area of the region occupied by that large family. And yet it is no exaggeration to say that few American races are less known than the Northern Dénés who, in point of territory, constitute the main bulk

---

* *Təni* is the Tsi|Koh'tin word for "man."

† It should be remembered in this connection that in all the Dené dialects the vowels have almost no linguistic importance whatever, the quintessence of the words being condensed in the initial consonants of each syllable. Also, it may be worth noting here that T and D, P and B, G and K, etc., are commutable even within each separate dialect.

‡ The aboriginal race of the Alaskan littoral is called Tlingit after the word it uses to say "man." Why should this not also be the case with the Dené family?

§ The Athapaskan Bibliography, *passim*, 1892.

‖ Language as a test of Mental Capacity, by H. Hale. Transact, R. S. C., p. 81, 1891.

of the whole nation. West of the Rocky Mountains, they are to be found from 51° 30′ of latitude to the borders of the Eskimo tribes, while on the east side of the same range they people the immense plains and forests which extend from the Northern Saskatchewan down almost to the delta of the Mackenzie River. From West to East they roam, undisputed masters of the soil, over the almost entire breadth of the American Continent, though a narrow strip of sea shore country separates their ancestral domain from the waters of the Pacific and those of the Atlantic. With that unimportant restriction, they might be said to occupy the immense stretch of land intervening between the two oceans!

In the words of Horatio Hale, this is, east of the Rocky Mountains "a dreary region of rocks and marshes, of shallow lakes and treacherous rivers, offering no attractions except such as the hunter finds in the numerous fur-bearing animals which roam over it and afford the native tribes a precarious subsistence. When this resource fails, they live on lichens which they gather from the rocks."* West of the Rockies, the country inhabited by them is rugged and heavily timbered, dotted with numerous deep lakes, and intersected by swift, torrential rivers. Their staple food is venison and salmon, according to the geographical position of their tribal grounds.

I have already given, in a volume of the "Proceedings of the Canadian Institute,"† the names and habitat of the northern tribes together with their approximative population. Let me only remark that in that list I classed the Beaver Indians as a separate tribe merely to conform to the long established custom of the traders and missionaries. But as in America, Ethnography is based chiefly, if not entirely, on Philology, I must explain that, from a philological standpoint, the Beavers (*Tsa'tenne* in Carrier) are genuine Tsé'kéhne. The idiomatic differences noticeable in the speech of these two artificial divisions are not any more pronounced than those which exist between the dialects of the Lower and the Upper Carriers. The reason the Beavers go by a distinctive name even among their congeners is that, being citizens of the plains, they cannot with propriety be called Tsé'kéhne or "Inhabitants of the Rocks" viz.: the Rocky Mountains.

For the perfect completeness of our aboriginal census, we should add to the above the Sarcees, a band of Tsé'kéhne who, upon a difference

* Language as a test of Mental Capacity, p. 81; Transact. R. S. C. Vol. IX., Sec. II, 1891.

† The Western Dénés, etc., Proc. Can. Inst. Vol. VII., p. 113.

arising from a trivial offense,* separated, not very long ago from the main body of the Dené nation and were adopted by the Blackfeet, an Algonquian tribe, among whom they have since lived, while keeping their linguistic autonomy. They do not number more than 100 souls.

An ethnologic problem which is not yet, and will perhaps never be solved, is the question, How did it come to pass that large portions of the Dené nation detached themselves from the main stock and migrated south? When did this exodus occur? What was the route followed by the adventurous bands? The man is probably yet unborn who will satisfactorily answer these questions. It may be that the interested tribes have some legends or traditions which might throw some light on the subject; but I think this is hardly the case.† As far as the northern Dénés are concerned, they do not even suspect the existence of any kinsmen south of the Tsi|Koh'tins' territory. Two facts only seem pretty safely established, namely: the separation of the southern from the northern tribes happened centuries ago; and, moreover, the national movement resulting in the division of the nation into two different camps was from north to south. The first assertion is proven by the fact that "when the Spaniards first met them [the Navajos] in 1541, they were tillers of the soil, erected large granaries for their crops, irrigated their fields by artificial water-courses or *acequias*, and lived in substantial dwellings, partly underground."‡ In support of the second statement, I need only refer to a tradition current among some western tribes according to which "days were formerly exceedingly short; so short indeed that sewing the edge of a muskrat skin was all that one woman could do between sunrise and sunset." This unmistakably points to the arctic regions as places of previous residence.

Unknown to themselves, important branches of the great Dené tree thrive thousands of miles away from the parental stem. As far as I can ascertain from the latest and most reliable source§ available, they are, or were until recently:—

---

* According to Mr. W. E. Traill, an H. B. Co's officer who has passed many years in close proximity to the Sarcees, this separation was caused by the following circumstances: A party of Tsé'kéhne were target shooting when a dog happened to take on the arrow planted in the ground as a target one of those liberties of which the canine gent is so fond. Thereupon the dog was shot by the possessor of the arrow, upon which that of the shooter was killed by the master of the original offender. Then followed numerous reprisals which could only be stopped by the voluntary departure of one band of related families which became the Sarcees.

† The above had been written for some time, when I read in Dr. Brinton's *American Race* that "the Navajos have no reminiscence of their ancestral home in the North."

‡ Brinton's *American Race*, p. 72, citing A. A. Bandelier "Indians of the Southwestern U. S."

§ 60th Annual Report Commissioner of Indian Affairs, 1891.

1. The Kwalhiokwas *, the Umkwas and the Totunies in Oregon. The Report of the Commissioner of Indian Affairs, for 1891 (Vol. II., p. 82), gives 78 as the number of the Umkwa population in the Grande Ronde Agency, with additional, though undetermined, numbers in the Siletz Agency. According to the same authority, the Totunies on Rogue River aggregate 47, while their congeners on the Siletz reserve cannot be numbered owing to their intermarriages with alien tribes.

2. The bands respectively called Hoousolton, Miscolt, Hostler, Matilden, Kentuck, Tishtangatang and Siaws in California†, but better known under the collective name of Hupa, from that of their common reservation in the Hupa Valley. They aggregate 492.

3. The Wailáki, likewise on the Pacific (Gatschet), numbers unknown.

4. The Navajos, in Arizona, the most populous and flourishing of all the Dené tribes, since they number, according to the latest and most accurate accounts, no less than 16,102 souls.‡

5. The various tribes of Apaches of which the following is a list showing their habitat and present population :—

(a)	The Oklahoma Apaches, in Oklahoma Territory	325
(b)	The Jicarilla Apaches, in Colorado.....	824
(c)	The Mescalero Apaches, in New Mexico	531
(d)	The White Mountain Apaches, in Arizona.....	130
(e)	The Coyotero Apaches, in Arizona.....	423
(f)	The San Carlos Apaches, in Arizona.....	831
(g)	The Tento§ Apaches, in Arizona.....	760
(h)	The Apaches of Camp Apache, in Arizona.....1,878	

* Contradictory statements and apparently misapprehension as to the names and present status of the Southern Pacific Coast Dénés render an exact classification of them difficult. Thus Mr. Horatio Hale (*Language as a Test of Mental Capacity*, p. 85, 1891) speaks of the Kwalhiokwas as still lingering in one of the Pacific States, while Dr. A. S. Gatschet, in his work on "The Klamath Indians of Southern Oregon, Vol. I. p. 45," published one year *earlier*, states that they have disappeared together with the Tlatskanai, another Dené tribe. The same ethnographer mentions side by side (*op. cit.*) with the Hupas the Wailáki, reference to whom I find in no other author. The Totunies are called Totutunies by H. Hale (*op. cit.*), Tututenas by Dr. Brinton (*op. cit.*), Tootoonas by Mr. Morgan (*60th Ann. Rep.*), Tutatamy by P. de Lucy-Fossarien (*Extrait du Compte Rendu stènographique du Congrès international des sciences ethnographiques ....Etude de philologie ethnographique par M. P. de Lucy-Fossarien, Paris, 1881*).

† After Prof. O. Mason (*The Ray Collection from Hupa Reservation*, pp. 206, 207).

‡ According to Horatio Hale (*Language as a Test, &c.*, p. 90), that tribe was erroneously thought to number in 1889 as many as 21,000 members.

§ These are not all pure Dénés, many being mixed with the neighboring tribes, or even altogether aliens as to the race to which they belong.

In Mexico, the number of Apaches is doubtful, since, according to Dr. D. G. Brinton, "although the Mexican census of 1880 puts the Mexican Apaches at 10,000, no such numbers can be located."* The same author then goes on to state on the strength of information emanating from Mr. Henshaw, of the Smithsonian Institution, that "the only Apache band now known to be in Mexico are the Janos or Janeros in Chihuahua, made up of Lipans and Mescaleros.†

6. The Lipans, in New Mexico, who have dwindled down to forty individuals. Their original home appears to have been on the Rio Grande.‡

It would not be pleasant to be represented as playing the role of the carping critic. Yet even the fear of appearing to merit this uncomplimentary epithet, cannot deter me from pointing out how utterly meagre and unreliable are the data possessed, even at the present time, by the best ethnographers relatively to the Dené stock. Despite the correct list of the Northern tribes given by the writer in the last volume of the "Proceedings Canadian Institute," I find that Dr. D. G. Brinton in his recent book "The American Race," published at Washington two years after the aforesaid classification had been printed in Toronto, omits no less than six Dené tribes of the great northern division. To show how utterly mixed ethnography appears to be when it is a question of locating the various Dené tribes, and thereby to excuse the details into which I find myself obliged to enter, I take the liberty of quoting the following sentences from the above mentioned work :—

"These [the Dénés] extend interruptedly from the Arctic Sea to the borders of Durango, in Mexico, and from Hudson Bay to the Pacific. . . The Loucheux have reached the mouth of the Mackenzie River, the Kuchin are along the Yukon, the Kenai on the Ocean about the peninsula that bears their name, while the Nehaunies, Sekanies and Takullies are among the mountains to the south. The Sarcees lived about the southern head waters of the Saskatchewan." §

Now, with all the deference due to such a veteran ethnographer as Dr. Brinton, truth bids me state that :—First, It is almost absolutely certain that no branch of the Dené family is stationed on the Arctic Sea, the whole coast of which is occupied by Eskimo tribes. Second, There

* "The American Race," p. 69, Washington, 1891.

† *Ibid.*

‡ *The Karankawa Indians*, etc., by A. S. Gatschet ; Cambridge, Mass., 1891.

§ The American Race, pp. 68, 69.

are no Dénés on the Hudson Bay any more than on the Pacific. The former is peopled on the north by the Eskimos and on the south by tribes of Algonquian parentage, while several alien races cover the whole northern coast of the latter, with, perhaps, a single insignificant exception.* Third, The Loucheux and the Kuchin are one and the same tribe under different names, the first being that originally applied to it by the French-Canadian voyageurs, while the second (which should read Ku-tchin or Ku-t'qin, the last syllable being *exploded* with the tongue and teeth) is more in honour among English-speaking ethnographers. The latter vocable is the exact equivalent of the Carrier "hwo'ten", the Tsé'kéhne "hwot'qen", the Tsi|Koh'tin "kwo'tin", all of which, as we have already seen, signify "Inhabitants." Fourth, The Kenai spoken of by Dr. Brinton are probably the K'naia-Kho-tana of Dr. Powell and both authors may be right in placing their habitat on the Pacific Ocean. Yet it must be admitted that this would be more evident, were not Dr. Brinton to transport it, ten pages further on, among the immense plains claimed by the Blackfeet as their ancestral home.† 5th, The would-be Nehaunees, Sekaunies and Takullies call themselves Nah'ane, Tsé'kéhne and Ta|Kǫ|ne respectively. 6th, The Sarcees *now live* about the southern head waters of the Saskatchewan, but formerly *lived* some degrees further north among the Beaver Indians with whom they are congenerous, even as a subdivision of the Tsé'kéhne tribe.

Nothing but a desire of serving the interests of ethnological science has prompted the above remarks. That I can prove all I advance will not be doubted by those who are cognizant of the opportunities I enjoy of ascertaining the real ethnologic status of the tribes by which I am surrounded or of those which are so closely related by blood and language with that among which I now live. The inaccuracies which they are aimed at correcting must also be my excuse for venturing to present below the list, as complete as I can make it, of all the Déné tribes. A very few of the southern tribes may be unwittingly omitted; but I would rather sin by omission than by exaggeration. All the northern tribes

* This is the *K'naia-K'ho-tana* who are now said to reach the coast on Cook's Inlet (Dr. Powell's "Indian Linguistic Families," 7th Ann. Rep. Bur. Ethnol.). But the fact that this learned ethnographer associates thereto the "Ahthena" of Copper River renders the identification of that tribe somewhat doubtful, inasmuch as the "Ahtena," unless they are misnamed, must be exogenous to the Déné stock, since that very name means in Déné "foreigners," and is used by our aborigines to designate all Indians of non-Déné stock. K'naia-Kho-tana, however, seems to have the right linguistic ring about it, and apparently refers to the "people of the river K'naia," whatever this last noun may mean.

† "Their [the Blackfeet] bands include the Blood *or K'enai* and the Piegan Indians" p. 79. The italics are mine.

are given without an exception, though I do not detail the ramifications or subdivisions of the Loucheux, and therefore omit any mention of the Kenai or K'naia-Kho-tana. The figures represent the population of each tribal division. In the case of the southern tribes they are compiled from the latest official accounts available. For the north-eastern divisions they are those of Rev. E. Petitot corrected down to date by Mr. Rod. Macfarlane, an H. B. Co's officer who has passed over 40 years of his life among the Indians he enumerates. I am myself responsible for the figures representing the numbers of the north-western tribes.

CLASSIFICATION OF THE DÉNÉ TRIBES.

NORTHERN DÉNÉS.

	About
Loucheux: Lower Mackenzie River and Alaska	4,400
Hares: Mackenzie, Anderson and MacFarlane Rivers	600
Bad-People: Old Fort Halkett	200
Slaves: west of Great Slave Lake and McKenzie River	1,000
Dog-Ribs: between Great Slave Lake and Great Bear Lake	1,000
Yellow-Knives: north-east of Great Slave Lake	500
Cariboo-Eaters: east of Lake Athabaska	1,200
Chippewayans: Lake Athabaska, etc.	3,000
Tsé'kéhne: both sides of Rocky Mountains	500
Beavers: south side of Peace River	700
Sarcees: east of Rocky Mountains, 51° lat. north and south.	100
Nah'ane: Stickeen River and east	700
Carriers: Stuart's Lake, north and south	1,600
Tsi|Koh'tin: Chilcotin River	460

SOUTHERN DÉNÉS.

Umkwas, Totunies and (?) Kwalhiokwas: Oregon	150
Hupas: Hupa Valley, California	492
Wailákis: Northern California	(?) 130
Navajos: Arizona	16,102
Apaches: Oklahoma, Colorado, New Mexico and Arizona	5,702
Lipans: New Mexico	40
Total of the Northern Tribes	15,960
Total of the Southern Tribes*	22,616
Total of the whole nation*	38,576

* Exclusive of the problematic Kwalhiokwas, the Umkwas of the Siletz Agency, the Mexican Apaches, or any such bands as are not controlled, even remotely, by the office of the U. S. Commissioner Indian Affairs.

A tribe of Atnas, Adenas, Atnahs or Ahthenas, whose habitat would be the extreme north-west of this continent, is occasionally mentioned in ethnographic literature as belonging to the great Déné family. Pilling gives it a place in his "Bibliography of the Athapaskan Languages." There must be here a mistake either of name or of identification. "Atna," etc., is a Déné word which means "foreigner, heterogener," and is used to qualify *all* aboriginal races which are *not* Déné. Either then the Atnas of the travellers and ethnographers are not Déné, or if they belong to that race they must be misnamed.

MAIN CHARACTERISTICS OF THE DÉNÉ RACE.

If there is in the broad world a family of human beings which, though a mere subdivision of a larger group of the genus *homo*, plainly demonstrates, through the diversity of its many branches, the fallibility as ethnic criteria of all but one of the various sciences which go to make up Ethnology, this is most certainly the Déné family. Savants now-a-days seem too prone to study man as they would a mere animal. Perhaps they overlook too easily the fact that he is a rational being. If a part of the animal kingdom, he is there a king without peer; and to judge him after the same standard as we do the brutes of creation should be considered unscientific. We hear constantly of bodily measurements, of anthropometry and craniology. Now, without entering into the technicalities of these sciences, let us apply their test, I do not say to those portions of the Déné people which live thousands of miles apart, but to a few coterminous tribes of that nation.

On the Western slope of the Rocky Mountains live side by side three tribes, the Tsé-'kéhne, the Carriers and the Tsiɬ-Koh-'tin, which may furnish us with convenient material to experiment upon.

The Tsé'kéhne are slender and bony, in stature rather below the average, with a narrow forehead, hollow cheeks, prominent cheek bones, small eyes deeply sunk in their orbit, the upper lip very thin, and the lower somewhat protruding, the chin very small and the nose straight. Go and inspect them, and perhaps out of every ten men, five who have long been fathers will appear to you like mere children. I have never seen but one fat person among them and none that was bald.

Now the Carriers are tall and stout without, as a rule, being too corpulent. The men, especially, average 1^{m}, 660^{mm} in height. Their forehead is much broader than that of the Tsé'kéhne, and less receding than is usual with American aborigines. Their face is full, with a nose generally aquiline and in every case better formed than that of their heterogeneous neighbours; their lips are thicker and their chin more prominent than

those of the Tsé'kéhne. Their eyes are also much larger and of a very deep black. Baldness, though rare, is sometimes noticed among them, while a few are literally obese. I am very much mistaken if two crania, one of an individual of each of these tribes, would not be pronounced by a craniologist as belonging to representatives of diametrically different races.

The Tsi|Koh'tin, on the other hand, are short in stature, broad faced and broad shouldered, with prominent cheek bones, heavy jaws and a nose which is not uncommonly thick and flattish. They may be said to have some physical resemblance to the Chinese. This description applies also to the Babines, who might be considered as a branch of the Carriers.

The only points in common between the three tribes are the dark eyes, the black, coarse and straight hair and the small hands and feet. Large hands and feet, however, are occasionally met with among Carrier men.* I do not speak of the complexion, because it varies even in the same tribe according to the occupation and food of the natives. A hunter will never return from a tour of two or three months in the woods without being considerably bronzed, while his fellow tribesman who has remained at home, without being as white as a European, will yet be fairer complexioned than most individuals of the Salish race of the South. Even in the matter of beard, a notable difference is observable, inasmuch as full beards, dark and coarse, heavy with hardly any shaving, are by no means rare among the Babine sub-tribe, while the rest of the Western Dénés are remarkable for the scarcity, or sometimes the total absence, of facial hair.

If we now consider the Déné nation from a psychological standpoint, the contrast between its divers branches will be still more startling. The Northern Dénés are generally pusillanimous, timid and cowardly. Now, can this be said of the Apaches? The Northern Dénés are moreover lazy, without skill or any artistic disposition. Is it so with the Navajos? Even among our Carriers, the proudest and most progressive of all the Western tribes, hardly any summer passes off but some party runs home panic stricken, and why? They have heard, at some little distance, some "men of the woods" evidently animated by murderous designs, and have barely escaped with their lives. Thereupon great commotion and tumult in the camp. Immediately everybody is charitably warned not to venture alone in the forest, and after sunset every door is

* I have also seen several really fair-haired Carriers, a peculiarity which is so much the more remarkable as it certainly can not be ascribed to blood mixture with persons of Caucasian descent.

carefully locked against any possible intruder. Compare these puerile fears of the Carriers with the indomitable spirit, the warlike disposition of the "terrible Apache." Compare also the rude, unartistic implements, the primitive industries of the same tribes with the products of the Navajo ingenuity, their celebrated blankets and exquisite silverwork especially-and tell me if in this case psychology is a safe criterion of ethnologic certitude.

A noteworthy quality of the Northern Dénés, especially of such as have remained untouched by modern civilization is their great honesty. Among the Tsé'kéhne, a trader will sometimes go on a trapping expedition leaving his store unlocked, without fear of any of its contents going amiss. Meanwhile a native may call in his absence, help himself to as much powder and shot or any other item as he may need; but he will never fail to leave there an exact equivalent in furs. Now compare this naive honesty with the moral code in vogue among the Apaches. Read also what is said of the Lipans, another offshoot of the Déné stock: they "live in the Santa Rosa mountains from which they stroll about making inroads in the vicinity to steal horses and cattle."*

With regard to mental attainments and force of character, I have shown in a paper read before the Royal Society of Canada,† that all the north-western tribes, Nah'ane Carriers and Tsi[Koh'tin, which have come into contact with alien races have adopted the most prominent practices and customs of the latter. Such is, to a great extent, the case even as regards mythology. Nay more: they have gone as far as to borrow the language of their neighbours in connection with their traditional songs and ceremonies. On the other hand, many Tsi[Koh'tin and not a few Babines speak Shushwap or Kitikson, while not one full blood individual of the two latter stocks has acquired enough of the Déné languages to decently hold conversation through them. The Dénés think it a mark of enlightenment to imitate the alien races with which they have intercourse, while these show the littlé esteem they profess for them by calling them "stick savages."

Now hear what a competent authority says of the Dénés of North California: "Next after the Karoks, they are the finest race in all that region, and they even excel them in their statecraft, and in the singular influence, or perhaps brute force, which they exercise over the vicinal tribes. They are the Romans of North California in their valour and in their far-reaching dominions. They are the French in the extended

* The Karaukwa Indians, by A. S. Gatschet, p. 41; 1891.

† Are the Carrier Sociology and Mythology Indigenous, etc? Trans. R. S. C. Sec. II, 1892.

diffusion of their language. They hold in a state of semi-vassalage most of the tribes around them, exacting from them annual tribute in the shape of shell-money; and they compel all their tributaries to speak Hupâ in communication with them. Although most of these tributaries had their own tongues originally, so vigorously were they put to school in the language of their masters, that most of their vocabularies were sapped and reduced to bald categories of names."*

The Northern Dénés, who are eminently gentle in disposition, have generally shown a remarkable receptiveness. And this explains how it is that, with few exceptions, they are all to-day practical Christians, and conform to the customs of the whites as much as their social status will permit. In opposition to this, we find that the Navajos and the Apaches still hold to their superstitious beliefs and ceremonies, and keep themselves aloof of any civilizing influence. This is so true that when, some years ago, an effort was made by the U. S. Commissioner of Indian Affairs to secure a tract of land close by the Cherokees' territory for the location of the Navajos, the former who, as is well known, have made great strides towards civilization, refused to entertain the proposition, "asserting that the Navajos were not civilized Indians."† I have never noticed any mention of real improvement in their midst since that time.

As for the Hupas, their agent stated ten years ago that they "are not to-day any more enlightened, advanced, progressive, industrious or better off in any way than they were when the Reservation was established, about twenty years ago."‡ That time has brought no change in their dispositions is made clear by the following words of their agent in his latest Report (1891): "They all cling to their own customs and laws as being far better than any others, and seem to look upon many of them as sacred. . . . Many of the Indians seem to look upon the attendance of their children [at school] as a favour to the teacher or the agent, and expect some reward for it."§ In strong contrast to the indifference for intellectual attainments manifested by the Hupas, let me refer the reader to what I said in a former essay‖ of the craving for knowledge evidenced by our Carriers, and the remarkable results it has produced even under the most untoward circumstances.

---

* Contributions to North American Ethnology, vol. iii., p. 72.

† The Cherokee Nation of Indians, by Ch. C. Royce, Fifth Annual Report, Bureau of Ethnology, Washington, 1883-84.

‡ Indian Affairs Report, 1881, 6; *apud* O. E. Mason's The Ray Collection, p. 207.

§ Sixtieth Annual Report Commissioner Indian Affairs, 1891, vol. I, p. 220.

‖ The Western Dénés; Proc. Can. Inst., vol. vii., p. 165.

Again, the folk-lore of the North-Western Dénés greatly differs from that of their immediate Eastern neighbours and congeners, while there is no point of affinity between that of either divisions and the mythology of the Navajos.

How is it then that tribes of aborigines occupying so widely separated territories and so utterly dissimilar from a psychological, technological, sociological and mythological standpoint can be classed under one single denomination as Dénés? The answer is in every mouth: this is owing to linguistic analogy. Language, therefore, is the *trait-d'union* which unites into one homogeneous body such apparently heterogeneous elements. Through it we are certain that the same blood flows in their veins, and that they are the children of a common father, whoever he may have been. If any stronger argument can be adduced in support of the paramount importance of Philology as an ethnological criterion, I am at a loss to discover what it can be.

Hence it will be seen that my initial remarks concerning that class of modern scientists who lay so much stress on the physical structure of man to the detriment of his special characteristic as a distinct genus, thinking and speaking, were not unwarranted. If even the *ensemble* of the peculiarities which differentiate him into a rational, social being cannot lawfully claim the first place in the ethnologist's estimation, *a fortiori* this cannot be granted to those features which he possesses in common with non-human animals. In the words of Horatio Hale, "the grand characteristic which distinguishes man from all mundane beings is articulate speech. It is language alone which entitles anthropology to its claim to be deemed a distinct department of science." * One needs not be a scientist to see the correctness of this view, and it is a long time since Quintilian said: "When the Creator distinguished us from the animals it was especially by the gift of language.... Reason is our portion, and seems to associate us with the immortals; but how weak would reason be without the faculty to express our thoughts by words, which faithfully interpret them! This the animals want, and this is worth more than the intelligence of which, we must say, they are absolutely deprived." †

I have not so far been fortunate enough to come across any vocabulary of a southern Déné dialect, and the only continuous Navajo texts I have ever seen are those of the "Mountain Chant" published by Dr. W.

* Language as a Test of Mental Capacity, by H. Hale; Transact. R.S.C., Vol. IX., p. 77, 1891.

† Quintilian, translated by La Harpe, Dijon, 1820.

Matthews.* Now, clothing these texts with the orthography denotive of the peculiarly exploding and sibilant sounds, which I think they must receive to become correct renderings, I find side by side, with some terms proper to the tribe or borrowed from adjacent stocks, no less than seventy-two words which are easily recognizable here, at a distance of perhaps 2,000 miles from the nearest Navajo. To form a just idea of the proportion of genuine Déné with local or foreign words, it should be borne in mind that these texts are composed merely of a few words very often repeated.

DISTRIBUTION OF THE WESTERN DÉNÉS.

Now that we have made some acquaintance with the divisions and main traits of the Déné nation in general, we may particularize and furnish the reader with more precise ethnologic data concerning the tribes whose technology and industries we are about to review. These we have already named: they are the Tsiǀkoh'tin, The Carriers and the Tsé'kéhne. As some savants have done me the honour of asking for more detailed information on their ethnographic status than were contained in a former paper on the same, I shall now proceed to give their tribal subdivisions or septs, together with their aboriginal names, the habitat of the natives thereby determined and, as far as practicable, their present population, and the number of their villages.

West of the Rocky Mountains we have from south to north:—

The *Tsiǀkoh'tin*, who actually inhabit the Chilcotin valley and roam over the bunch grass covered plateaus that skirt it on either side, from the 50° to the 52° 30′ of latitude north. Their territory is bordered in the east by the Fraser River, and in the west by the Cascade Range of mountains. But not unfrequently a few bands manage to cross over and make inroads for hunting purposes into the territory of the Sishaǀ and other coast tribes. Of course the latter resent these encroachments upon their ancestral domains; but as hunting for peltries is not extensively practised by them, the harm done by the poachers is not very great.

It is perhaps worth remarking in this connection that the "Linguistic Map of British Columbia" prefixed to Dr. F. Boas' Report on the B. C. tribes for 1890† is somewhat inaccurate in that it gives the Tsiǀkoh'tin quite a tract of land on the east side of the Fraser which, as a matter of fact, is now and has been occupied from time immemorial by three villages of Shushwap Indians, viz.: Soda-Creek, Sugar-Cane and Alkali-

* Fifth Ann. Rep. Bureau of Ethnology, 1883-84.

† Sixth Report on the N. W. Tribes of Canada, London, 1890.

Lake. Nay more, until recently the Tsi|Koh'tin did not even extend as far as the Fraser. Some 25 years ago the bulk of the tribe inhabited Na'kûnt'|ûn, a village on the lake of that name (52° 40′ lat. by 125° 5′ long.) close by the Bilqulas' territory, whence they migrated almost in a body to the more fertile lands they now occupy.*

From a sociological standpoint they might be divided into the quasi-sedentary and the nomadic Tsi|Koh'tin. The former dwell on the north banks of the Tsi|Koh, called by the whites Chilcotin River. They are divided into two groups, viz.: the *Tɂɐs-Koh-'tin* (people of the Splint River) with one village on that creek close by the Fraser, population about 75; and the *T'ɂâ-theñ-Koh-'tin* (people of the river that trails through the grass) who have two villages near the Chilcotin 35 and 45 miles respectively west of the Fraser. Total population 190. An independent band of some 35 individuals, an offshoot of the same sub-division, has established itself near the Fraser facing Fort Alexander.

All of these Tsi|Koh'tin have abandoned their original semi-subterranean huts to dwell in log houses covered with mud according to the fashion prevailing among the neighbouring whites. They also cultivate wheat and other cereals, peas and potatoes with moderate success.

The nomadic Tsi|Koh'tin are called by the whites "Stone Tsi|Koh'tin" by allusion to their fovourite haunts, the rocky spurs of the Lillooet mountains and of the Cascade range where they live, largely on marmots. They have no fixed abode and except during the winter, they are constantly shifting from their southern to their northern borders, that is from the aforesaid mountains to the Chilcotin River, where they generally pass a few weeks of the fair season. I know of no more primitive people throughout the whole of British Columbia.

Apart from the above regular subdivisions their still remain at Na'kûnt'|ûn, or in the proximity of that lake, a few straggling members of the same tribe.

In his late paper on "the Shushwap people of British Columbia," Dr. G. M. Dawson gives† after Mr. J. W. Mackay, Indian agent, an interesting account of a hostile excursion of Tsi|Koh'tin warriors into the country of

* Were native testimony regarded as an insufficient proof of this, philology might still furnish us with corroborative evidence of unquestionable character. Thus the most remarkable feature of the present territory of the Tsi|Koh'tin tribe is its magnificent bunch grass (*Agropyrum* [*Triticum*] *repens* L.). Now they call it *Œnna-t'ɂâ*, or "grass of the foreigners," *i.e.*, the Shushwap. This particular species of grass is not met with north of the valley and borderiug tablelands of the Chilcotin River.

† Notes on the Shushwap people of B. C.; Transact. R. S. C. Sec. II, p. 24, 1891.

the Shushwap. On the authority of that narrative, the would-be invaders were pushed back by superior numbers into the Semilkameen valley where, by their prowess, they compelled their pursuers to come to terms and make a treaty of peace from which intermarriages soon resulted. "These strangers, who are said to have come from the Chilcotin country, are thus the earliest inhabitants of the Semilkameen valley of whom any account has been obtained." * Seven, out of thirteen words given by Mr. Mackay, as remnants of the original language of the invaders, are undoubtedly Tsi[Koh'tin, and make it certain that the Semilkameen Shushwap are partly of Déné parentage.

Immediately north of the Tsi[Koh'tin we find the Carriers or *Takhe[ne*, the most important in numbers, most widespread and progressive of all the north-western Déné tribes. They extend as far north as the 56° of latitude and are coterminous with the coast tribes on the west and the Crees and Tsé'kéhne on the east. The Coast Range on the one side and the Rocky Mountains as far as 53° lat. on the other, separate them from their heterogeneous neighbours. North of the 53°, they are in immediate contact with the Tsé'kéhne.

The Carriers are semi-sedentary Indians. They have fixed homes in regularly organized villages from which they periodically scatter away in search of the fish and fur-bearing animals on which they subsist. From south to north, their tribal subdivisions are:—

1. The ⌐thau'tenne (a contraction of ⌐tha-koh-'tenne, people of the Fraser River). They now have but one village, Stella (the Cape) contiguous to the old Fort Alexander, formerly one of the most important of the H. B. Co's. posts in British Columbia, now abandoned. They were originally several hundreds: they are now almost extinct as a sept. Whiskey and loose morals owing to the vicinity of the whites are responsible for this result. They are co-terminous with the Shushwap in the south and the Tsi[Koh'tin in the immediate west. I do not think that fifteen individuals of that sept now remain.

2. The *Nazku'tenne* (people of the river *Naz*). They are likewise greatly reduced in numbers, there not being actually more than 90 members of that sub-tribe, though they still inhabit two villages Quesnel and Black-Water.† The same causes, especially the former, as played havoc among the ⌐thau'tenne, are slowly but surely working out the

* *Ibid.* p. 25.

† The Black-Water or West River followed up by Sir. A. Mackenzie to reach the Pacific Coast.

ultimate destruction of the Nazku'tenne. Both villages inhabited by them are on the Fraser River.

3. Due west of the Black-Water village and ascending the river of that name to its source, we meet with a third subdivision of the Carriers, the *Nu-tca-'tenne* (probably corrupted from *Nu-tcah-'tenne*, people down against the island). These people dwell in four small villages, Trout Lake, ⅂us'kəz,* Pe-ɬ'ka-tcék,† and ⅂'ka-tco.‡ The latter is composed of a mixed population of Déné and Belqula descent whose first white visitor was the writer, ten years ago. The Nu-cha-'tenne formerly had several other villages (Tsitsi, ⅂rak, etc.), the sites of which are still discernible through small clearings in the forest. Their present total number may be a little over 135.

4. Immediately north of the Black-Water village, at the confluence of the NutcaKoh with the Fraser River, we have one village, Fort George or *⅂eitli*,§ the population of which forms one separate sept, the *Tano-'tenne* (people a little to the north). It numbers actually 130 persons. The Fort George Indians have on the east side of the Fraser very large and productive hunting grounds as far as, and comprising, the Rocky and Caribou mountains and spurs thereof. A village of the same sept, Tcinlak at the junction of the Na'kralKoh or Stuart's Lake River with the NuchaKoh had formerly a flourishing population which was, not very long ago, practically annihilated in one night by the TsiɬKoh'tin.

5. Two villages on Fraser Lake furnish us with our fifth tribal subdivision of the Carriers. Their population goes under the common name of *Natlo'tenne* (contracted from *Natleh-hwo'tenne* or people of Natleh.‖) About 135 persons form the population of their two villages Natleh and Stella,** one at each end of the lake.

The aggregate of the above enumerated septs constitutes what I generally designate under the collective name of Lower Carriers. Though slight linguistic peculiarities give to each of them a real individuality, yet the dialect of all contains very important characteristics common to the whole aggregate which differentiate it from that of any of the septs or subtribes which remain to review.

---

* "Half-⅂us," the name of a carp-like fish.

† "Wherewith one catches fat."

‡ "The Big-fattening."

§ "The Junction."

‖ "It (i.e., the salmon) comes back again."

** The Cape.

Under the name of Upper Carriers I include :—

6. The *Na-'kra-ztli-'tenne* or people of Na'kraztli* Stuart's Lake They inhabit two villages, Na'kraztli and Pintce† on the southern end, and on the middle of Stuart's Lake. They number 180 souls, and they are of all the Carriers those who have made the greatest strides towards civilization.

7. Immediately to the north-west, on the same lake and its tributaries, Lakes Tremblay, That'ɟah,‡ and Connolly, a second subdivision of the Upper Carriers, the seventh of the whole tribe, occupies four smal villages, two only of which are regularly organized with a chief and the usual native officers. These are Tha-tce,‖ and Sas-thût§ respectively at the confluence of Thatce river on Stuart's Lake and near Fort Connolly on the lake of that name. The others are 'Kəztce** formerly an important locality on Thatce river and Yə-Ku-tce†† at the north-western extremity of Stuart's Lake. The original home of all these bands was at the end of that lake, as is manifest from their common name as a sept: *T'ɟaz-'tenne*, people of the bottom or end of the lake. Their total population is not over 90.

Some nine or ten years ago, Drs. Tolmie and Dawson published conjointly a valuable ethnological map of this province,‡‡ which does not tally in every respect with my description of the northern limits of the Carriers' territory. The line of demarcation between the Carriers and the Tsé'kéhnes' hunting grounds passes, on that map, through the middle of Thatlah lake, giving the latter a large strip of land wkich I grant to the former. I must explain that the authors of that map thereby point to the *de jure* or original territory of the Carriers, while I sketch above the *de facto* or actual limits thereof. By right Bear's or Connolly lake and adjacent country belong to the Tsé'kéhne tribe; but, as a matter of fact, the village which is situated close to the H. B. Co's. fort is now the

* For the etymology of this name, see "The Déné Languages," Trans. Can. Inst. 1889-90, p. 188.

† Confluence of the *Pin* river.

‡ "Bottom of the water," the equivalent of the French "Fond du Lac." The real native name of this lake is *Kel-rə-pən*, *lit*, "*burden-near-lake.*"

‖ "The tail," (i.e., confluence in the lake) of the water.

§ "Black Bear bathing place."

** Confluence of the *'Kəz* river.

†† The confluence of the river *Yəkuzlli*, (the outlet of *Yako* lake).

‡‡ Appended to "Comparative Vocabularies of the Indian tribes of B. C.; Montreal, 1884.

rendezvous of representatives of three different tribes, namely : the Tsé'kéhne who periodically congregate there for trading purposes and have no permanent residence ; the Carriers, a band of whom now inhabit the village and hunt in the vicinity of the lake with the consent of the former ; and the ʇtnas or Kitiksons from the Skeena river who are considered as mere intruders and as such live there only on sufferance.

Both the Na'kraztli'tenne and the T'ɭaz'tenne receive from the Babines the name of 'Kutəne.

The following subdivisions might be designated under the collective name of Babines, since in language they are practically one, and the custom of wearing labrets which gave its distinctive name to one of them was common to both. They are :—

8. The *Nitu'tinni* (in Upper Carrier *Nato'tenne*) or Babines who inhabit the northern half of Babine lake in three villages and number actually some 310 souls.

9 The *Hwotsu'tinni* (in Upper Carrier *Hwotso'tenne*) or people of the river Hwotsutsən.* They are called *Akwilgét*, "well dressed," by the Kiliktons, their immediate neighbours of Tsimpsian parentage, and after them by the whites. They inhabit two villages, Tsé-tcah,† KéyəR-hwotqət,‡ and two smaller places now organizing, Tseɭ-'kaz-Kwoh,§ and Moricetown on the HwotsotsənKwoh or Buckley river and what is known in the country as the telegraph trail. All of these localities are within the northernmost extremity of these Indians' hunting grounds which extend from Français Lake up to the Skeena River. Several members of that sept are allied by blood with their alien neighbours, the Kitiksons. They number about 300.

The language of these different branches of the Carrier tribe, while remaining essentially the same, undergoes however marked variations corresponding to its ethnographical subdivisions. Upon that ground I have even sometimes asked myself whether distinct individuality as a tribe should not be granted to the Babines whose linguistic or even psychological peculiarities are so glaring that they cannot escape detection even by the most careless observer. Much of their dialect would indeed be "greek" to an ʇthau'ten visitor.

It is also but right to warn the reader that the three main divisions of the tribe into Lower Carriers, Upper Carriers and Babines, although

* Almost equivalent to "Spider."

† Down against the Rock.

‡ Old Village.

§ River of the axe edge.

founded on language and geographical distribution, are not recognized by the Carriers themselves, who know of no other than the above enumerated minor subdivisions.

The Tsi|Koh'tin and Carriers have a well organized society composed of the hereditary "noblemen" who own the land, and the common people who hunt with and for them. They formerly had no local head-chiefs. Moreover, irrespective of the ethnographic divisions based on language and habitat, they are divided into several gentes the members of which believe themselves bound by ties of the strictest relationship. They were originally exogamous, and throughout the entire Carrier tribe matriarchate or mother-right is the law governing succession to titles and property.

Among the *Tsé-'kéh-ne*, or "People-on-the-Rocks" a simpler and more primitive social organization obtains. That tribe, through necessity as much as from natural inclination, is entirely nomadic. As salmon is unknown throughout their territory, these aborigines have to be almost constantly on the move after the moose, cariboo and other large animals on whose flesh they mainly subsist. Father-right is their national fundamental law, and the whole tribe is composed of bands slightly differing in language, and with no regular chiefs. In fact, their society, such as it is, might almost be termed a perfect anarchy, were it not that the advice of the oldest or most influential of each band is generally followed as far at least as regards hunting, travelling and camping.

Though each band has traditional hunting grounds, the limits of these are but vaguely defined, which is not the case with those of the Carriers. Furthermore, several members of one band will not unfrequently be found hunting unmolested on the land of another. Therefore no very strict boundaries can be assigned to the following tribal subdivisions which comprise all the Tsé'kéhne population within the political borders of British Columbia :—

1. The *Yñ-tsñ-t'qenne*, or "people down over there" (*i. e.*, in the direction of an expanse of water) are the band which from time immemorial bartered out to the Carriers the axes and other primitive implements of which due mention shall be made further on. They are so called by the rest of the tribe by allusion to their commercial relations with the Carriers of Stuart's Lake. Their hunting grounds lie from Salmon River * to MacLeod's Lake and thence to the Fraser, by 53° 30'.

2. The *Tsé-'kéh-ne-az*, or "little-people-on-the-rocks" roam over the

* There are so many Salmon rivers in the north of British Columbia that it may be necessary to explain that the one here mentioned empties itself into the Fraser a little above Fort George.

land which extends between the latter lake and the summit of the Rocky Mountains. They are often to be found hunting on the western slope of that range.

3. The *To-ta-t'qenne* (" people-a-little-down-the-river ") inhabit the eastern slope and adjacent plains of the Rocky Mountains within British Columbia.

4. The *Tsa-t'qenne* (who call themselves *Tsa-huh*) or Beaver-people, roam over the large prairies contiguous to the Peace River, on the south side of that stream and east of the Rockies.

5. The *Tsé-'ta-ut'qenne* (the people against the Rocks) as hinted by their name, have their habitat chiefly at the base of the Rocky Mountains on the north side of the Peace River.

6. This is perhaps the proper place to mention the *Sarcees*,* who have been adopted by the Blackfeet Confederation, and actually live east of the Rocky Mountains by about 51° lat. north.

7. To the north of all the above sub-divisions, from the 56° to the north, we find the *Sas-chût-'qenne* or "people of the Black Bear" whose trading post was until last year Fort Connolly on the lake of that name.

8. Another band called *Otzən-ne* (people between or intermediary) claims the land which intervenes between the territory of the Saschut-'qenne and that of the Tsélohne on the west side of the Rocky Mountains.

9. Those *Tsé-loh-ne* (people of the end of the Rocks) live immediately north of the latter and their chief trading post is now B. L. O. (Bear-Lake-Outpost) on the Finlay River by 57° of latitude north. Their name is due to the fact that their habitat is an immense plain which is said to intersect the whole of the Rocky Mountains which are popularly believed not to extend any further.

The aggregate population of all these bands does not exceed 1,300.

The *Tsé'kèlne* are known to the Carriers under the name of *Ƴ'tat-'tenne* or " people of the beaver-dams," while the latter are responsible for the distinctive name of the Carriers—*Areƺne*, " packers." The nickname *Ta*-K*eƺ-ne* by which this tribe sometimes calls itself † is of recent origin It has no meaning in its language to which it is exotic, and I cannot

* Their aboriginal name as a sept is unknown to me. A century ago they had 35 tents with a population of 120. (History of Manitoba, p. 85).

† Indeed they even call thus all the races of Indians by opposition to the whites.

imagine whence it originated. It is the would-be *Tacullies* or *Takullies* of the ethnographers.*

The foregoing information will be found recapitulated in the following list showing the tribal subdivisions from south to north of the Tsilkoh'tin, the Carriers and the Tsé'kéhne.

TSILKOH'TIN TRIBE.

Stone Tsiɂkoh'tin ; immediately south of Chilcotin River.
Tɂɔskoh'tin ; ten miles north of the mouth of Chilcotin River.
T'ɂotheñkoh'tin ; north bank of Chilcotin River, 45 miles from its mouth.
Independent septs ; Fort Alexander and Nakûntl'ûn.

CARRIER TRIBE.

Ɂthau'tenne ; Fort Alexander.
Nazku'tenne ; Quesnelle and mouth of Black Water River.
Nutca'tenne ; on Black Water and throughout its basin.
Ɂano'tenne ; Fort George.
Natlo'tenne ; Fraser Lake.
Na'kraztli'tenne ; Stuart's Lake.
T'ɂaz'tenne ; upper end of Stuart's Lake and tributaries.

BABINE SUBTRIBE.

Nétu'tinni ; Babine Lake.
Hwotsu'tinni ; Buckley River and Français Lake.

TSÉ'KÉHNE TRIBE.

Yûtsût'qenne ; from Salmon River to McLeod's Lake.
Tsé'kéhneaz ; from McLeod's Lakes to the Rocky Mountains.
Totat'qenne ; immediately east of Rocky Mountains.
Tsat'qenne (the Beavers); south side of Peace River.
Tsè'taut'qenne ; base of Rocky Mountains close by preceding.

---

* The number of different orthographical readings of the names of the north-western Déné tribes is truly wonderful. Thus the Carriers (*Takɥne*, the "Porteurs" of the French Canadians) are called *Tahkali* and *Tahcully* by Anderson, *Teheili*, by Dawson and *Takully*, *Tacully*, *Takulli* by others. The Tsé'kéhne are *Thé-kka-nè* to Petitot, *Thekenneh* to Kennicott, and *Sicany*, *Siccani*, or *Sikani* to others. I am ashamed to own that I have myself countenanced in former papers the wrong reading "Sèkanais" of my predecessors here.

Sarcees; immediately east of Rocky Mountains, 51° lat. north.
Saschût'qenne; Connolly Lake and north. West side Rocky Mountains.
Otzɔnne; north of preceding, same side of mountains.
Tsèlohne; north of preceding, same side of mountains.

To the above I should add the *Nah·ane** whose hunting grounds lie to the north of those of the Tsé'kéhne. But I am not familiar enough with their tribal divisions to state them with any degree of certainty, nor do I sufficiently possess their technology to speak authoritatively of it. It may however be broadly stated that from an archæological standpoint the Western Nah·ane may be classed as Carriers, while the Eastern Nah·ane are to all practical purposes regular Tsé'kéhne.

* The so-called *Nehawni* of Pilling, the Na"ane of Petitot, the Nahâwney of Kennicott, the *Nehawney* of Ross and the *Nahawnies* of others.

CHAPTER II.

PRELIMINARIES—PHILOLOGICAL.

Even Philology is not without bearing on Archæology. More than once the former will prove a great help towards elucidating such problems as the relative age or history of the human products whose aggregate constitutes the *raison d' être* of the latter. Thus the necessaries of native life, those objects which are the most indispensable to savage man and whose appearance as technological items must therefore have been the earliest are, as a rule, expressed in Dené by monosyllabic roots as *thû*, water; K*wən*, fire; *ɣo*, fish; *tsa*, beaver; *'kra*, arrow; *pi*, snare; *kuh*, trap; etc. Other objects or implements of more complex nature or less general import, or the use of which supposes higher steps in the industrial ladder, are rendered by polysyllabic words. In the language of the Dénés, the more primitive an object, philologically also the simpler its name. Implements of complicated structure or of recent introduction among the aborigines have almost invariably names of similarly composite fabric.

These considerations have led me to give, either in the text or through foot-notes, the aboriginal name of each item of native technology mentioned in the present monograph. As we shall presently see, some of these names admit of no literal translation; but when such translation is possible, it shall accompany the Indian word. Unless otherwise noted, those names will be in the Carrier dialect.

That the reader may the more easily recognize the category to which such words etymologically belong, and thereby judge of the place the objects they represent occupy in the Dené technology, I deem it not irrelevant to reproduce here the following paragraphs from a former paper on the Dené languages.

"Considered in their material structure and etymology, the Dené nouns may be divided into four classes. These are the primary roots which are all monosyllabic as in Chinese. Such are *ya*, sky; *thû*, water; *tsé*, stone; *s̄əs*, black bear; etc. Theyare essentially nominative: they neither define nor describe the object they designate; they merely differentiate it from another. I consider them as the remnants of the primitive Dené language, inasmuch as they are to be found with little or

no alteration in all the dialects of the family, whatever may be the distance intervening between the aborigines who speak them.*"

No etymology or other explanation than that of the text will be given of words belonging to this category, because they admit of none. Thus the context will indicate for instance that Rəɣ is a war club, that *we* is a kind of fish trap, etc., without any attempt being made at explaining the origin of either word, or at giving a more literal sense of them than that furnished by the translation, which would be impossible. They have no derivation, but on the contrary may serve as the compounding elements of other words of secondary import.

"The second category comprises roots of simple import which are genuine unsynthetical substantives though polysyllabic, generally dissyllabic, in form. To this category belong words as *təne*, man; *t'sèkhè*, woman; *pəñrən*, lake; etc. They possess, to a limited extent, the properties of the monosyllabic roots, being likewise merely determinative and oftentimes varying but little with the change of dialect."†

Here it may be added that even in these nouns there is generally one syllable which is more important and contains, as it were, the quintessence of the word. Thus it is with the *ne* of *təne*; the *t'sè* of *t'sèkhè*, the *pən* of *pəñrən*. In composite words, such syllables only are retained. So the Carriers will more commonly say *ne-əran* murderer, than *təne-əran*, while in such compounds as *ɣi-t'sè*, she-dog, and *pən-tco*, big lake, the weak or secondary syllable has also disappeared.

"The third class contains composite nouns formed, as a rule, by compounding, though sometimes by agglutinating, monosyllabic or dissyllabic roots. Such are *ne-na-pa-ra* (literally: man-eyes-edge-hair) eye lashes; *təpe-té*, wild sheep horns; *mai-ré*, vegetable oil instead of *mai-ké*, literally, fruit-oil. These nouns being mere compounds of roots belonging to the two former categories have the same degree of relative immutableness with regard to the various dialects as the radicals which enter into their composition."‡

In like manner, implements designated by names of this category may be of as ancient origin as those denominated by words of the first.

Thus, *tsa-m-piɣ*, beaver snare, contains two ideas of simple import—the medial *m* being merely euphonical and demanded by the following *p*. That words of this class may not be confounded with terms of the preceding, their compounding roots will be separated by a hyphen.

* The Déné Languages, etc. Transact Can. Inst. vol. I, 1889-90, p. 181.

† *Ibid.*

‡ *Ibid*, p. 182.

"The fourth and last class is made up of verbal nouns which, as their name indicates, are nothing else than verbs in the impersonal or personal moods employed to qualify objects of secondary import with the help sometimes of a radical noun, sometimes of a pronoun, and always of a prepositive particle prefixed to, or incorporated in, the verbal substantive. Of this description are the words *pe·yən-əl'qəl* (lit. with-earth-one cleaves), plough; *u-'kwət-'səzta* (lit. it-on-one sits), seat; *ə'ten-pa-yə*R (lit. work-for-house) work-shop."*

Very few of the objects or implements designated by words of that class can be regarded as of really ancient origin.

As for the orthography followed in the present monograph for rendering aboriginal words, it is as follows :—

The vowels have the continental sounds. When accentuated, they undergo the same phonetic changes as French letters do when affected by similar accents. Thus *â*, *î*, *ô*, have the same sound as in French; *e* and *u* as in Italian; *é* is sounded as the *e* of "mets", *è* as that of the English "ten", while *ə* corresponds to the so-called French *e muet* in such words as *je, te, le.* *W* is always a consonant.

Subject to the following remarks, the consonants have also the continental sounds. *H* is strongly aspirated; *ñ* represents a nasal *n* followed by a common or sounding *n*; *ɭ* is a lingualo-sibilant which is obtained by the emission of a hissing sound on both sides of the tongue curved upwards previous to its striking the lingual letter; *r* is the result of uvular vibrations, and when immediately following a guttural (*g, k, kh,* 'k, or K) it is almost impreceptible to the ear; K, and R, are respectively *k* and *r* pronounced with a very guttural inflection; *q* nearly resembles *ty*, both letters being simultaneously sounded; *c* represents the English double consonant *sh.* The apostrophe (') prefixed to *k, t, q*, adds to the regular pronunciation of those letters the exploding sound peculiar to most Indian languages. *s̄* is intermediate between *s* and *c.*

Th, kh, are equivalent to t+h and k+h and are produced by a single emission of voice. T's and t'ɭ are "exploded" and their exact value cannot be realized otherwise than by hearing them pronounced by a competent person.

The hiatus is represented by a period in the upper part of the line (·).

* *Ibid., ibid.*

WORKS AND IMPLEMENTS UNKNOWN AMONG THE WESTERN DÉNÉS.

Before attempting to detail what our aborigines have or had of archæological ware, it may not be amiss to enumerate what they do not have and apparently never had.

Throughout the whole extent of their territory, no mounds, enclosures, fortifications of a permanent character or any earthen works suggesting human agency are to be found, nor is their existence, past or present, even as much as suspected by any Carrier, Tsé'kéhne or Tsi[koh'tin. In the same manner, pottery, clay implements, perforated stones, mortars, ceremonial gorgets, gouges, stone sledges and articles of shell either plain, carved or engraved, have to this day remained unknown among them. They did formerly, and do still occasionally, use stone pestles. But for the mortars common among natives of most heterogeneous stocks, they substitute a dressed skin spread on the ground whereon they pound dried salmon, salmon vertebræ, bones, etc.

Such sweeping assertions may astonish those readers who have already been informed by Dr. D. G. Brinton that among the Dénés "utensils were of wood, horn or stone, though the Takully women manufactured a coarse pottery and also spun and wove yarn from the hair of the mountain goat."* This statement is quite a surprise to me, inasmuch as I supposed it was a fact well known to Americanists that no pottery of any description existed among such north-western stocks of aborigines as the Déné, the Tsimpsian, the Haida, the Kwakwintl, the Tlinget and the Eskimo. As for the spinning of the hair of the mountain goat Dr. Brinton probably confounds the Carriers (his Takully) with the Pacific Coast tribes which did and occasionally do make good blankets out of that material.†

I have also mentioned the mortars among articles unknown to the original Dénés. Therefore I must call attention to a statement of A. Niblack in his valuable monograph on "The Coast Indians of Southern Alaska" wherein he says: "These [mortars] were by some people supposed to indicate that in early days these Indians ground maize *as did and do the hunting Indians of the interior.*"‡ The italics are mine.

* The American Race, p. 71.

† A gentleman speaking *de visu* states that "yarn is spun from the wool of the mountain goat (not the mountain sheep or big-horn) and is woven into excellent blankets which are highly coloured and ornamented." (Notes by Mr. J. C. Callbreath in G. M. Dawson's "Notes on the Indian tribes of the Yukon District" etc., reprint, p. 6). But this statement applies to the Tha[than division of the Nah'ane, not the Carrier tribe.

‡ The Coast Indians, etc., in Ann. Rep. of the U. S. National Museum, p. 281; 1890.

These words, coming from an author who is generally so well informed, are at best perplexing. To whom does he allude in this reference to the maize growing huntsmen of the interior? Most people will answer that it must be to the Déné Indians who, in the latitude within which the subjects of his sketch are stationed, people the American Continent practically in its whole breadth. Of course, he cannot thereby refer to the Iroquois and the Hurons whose habitat is close to the Atlantic, not the Pacific coast. Now it is so well known that the Dénés were but recently innocent of the least attempt at cultivation that I cannot regard this extraordinary assertion as anything else than a slip of the pen.

A natural apathy, lack of artistic ambition or want of skill caused the Western Dénés to be practical, rather than æsthetic craftsmen. Where extra exertion was not absolutely necessary, it was very seldom bestowed upon any kind of work. Therefore most of the implements which we shall examine in the following chapters are exceedingly simple and sometimes even rude in appearance. For instance, the Déné, knowing by experience that a stone lashed, while in its natural state, to his fishing-net was doing as good service as the most elaborate sinker, never attempted to fashion it into any of the artistic shapes given similar implements by many other families of Aborigines. For this reason carved or even merely grooved sinkers are also to be classed among the industrial implements unknown to the Western Dénés.

A fact which will perhaps elicit incredulous comment is that not only our Aborigines' earliest acquaintance with tobacco, native or Nicotian, dates only from 1792 for the Tsé'kéhne and 1793 for the Carriers, but even the very act of smoking was unknown to them prior to those dates. As a consequence, pipes of any material or form are an adventitious

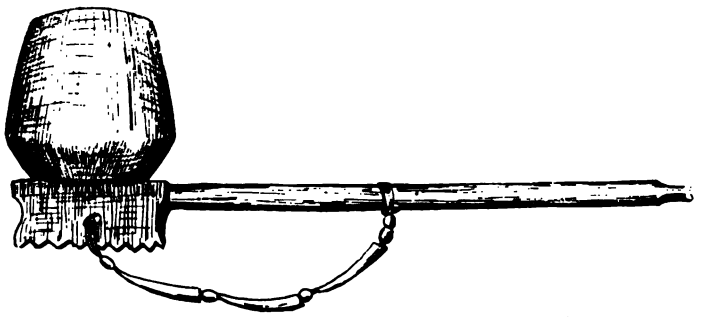


Fig. 1.

item amongst them. Fig. 1 represents the earliest known model of pipes of Déné manufacture. It consists of a stone bowl with a serrated base wherein a wooden stem has been inserted. Bowl and stem are connected

by means of a chain of dentalium shells alternating with coloured glass beads. A pipe strikingly similar in form, but *minus* the string of shells and beads, was also in use among the Shushwap Indians, the southern neighbours of the Western Dénés, as appears from a sketch in Dawson's "Notes on the Shushwap People of British Columbia." *

Against the above assertion as to the absence of smoking pipes among the primitive Dénés, it might be contended that the Tsiɬkoh'tin, who were more venturesome than the two other tribes, must have known through the Coast and Shushwap Indians, the species of wild tobacco which is said to have been cultivated by the natives of Queen Charlotte Islands, or gathered in its wild state by the Shushwap.† But to any person who is aware of the irresistible attraction all races of Aborigines feel towards the use of the soothing weed, whether genuine or counterfeit this hypothesis will appear altogether gratuitous. Albeit the tribal intercourse between the Tsiɬkoh'tin and the Carriers was formerly a rather rare occurrence and not always of the most friendly description, had smoking been in vogue among the former, the latter could not well have failed to notice in their neighbours a practice which is claimed to have appeared so strange to them at the time of their first meeting with the whites. Now both the Tsé'kéhne and the Carriers are positive that it was unknown to their ancestors previous to their encounter with *Mə-tsi-ra-nəɬɟoñ* ‡ or Sir Alex. McKenzie; and they still recount, with no lack of amusing details, first their stupefaction at beholding smoke issuing from men's mouths, and then their scorn for tobacco when they ascertained that it was not edible. §

---

* Transact, R. S. C. p. 12, fig. 3; 1891.

† *Vide:* "On the Haida Indians of Queen Charlotte Islands," by G. M. Dawson, p. 114 b, 115 b, Montreal, 1880; "Notes on the Shushwap People of B.C.," by G. M. Dawson, Trans. R.S.C. Sect. II., p. 23, 1891; "Descriptive Notes on Certain Implements," etc., by Al. Mackenzie, Trans. R.S.C., Sect. II., p. 55, 1891; "The Coast Indians of Southern Alaska," etc., by A. P. Niblack, p. 333, 1890.

‡ In Tsé'kéhne: "his hair is plentiful," perhaps by allusion to the wig or queue worn by Sir Alex. Mackenzie.

§ The derivation of the word *ɔte'ka*, by which the Carriers designate tobacco, has long puzzled me. It must be either a borrowed word or a word formed by agglutination, as the name of the horse (*yezih-ɟi*, "elk-dog" or domestic elk). Now I have studied that word in the vocabulary of over twenty tribes, all contiguous, mediately or immediately, without being able to discover anything like an homonymous equivalent. On the other hand, the two parts of which it is composed, *ɔte* and *'ka*, are genuine Carrier particles which, taken separately, are not without meaning, but to which no rational signification can be ascribed when joined together. Yet the names of all new objects in the Déné languages are either borrowed from foreign dialects, or more generally formed by compounding, that is by the juxtaposition of two or more names of objects already known. Thus, in Tsiɬkoh'tin the name of the tobacco is *tsəɟ-yu*, which means "smoke-medicine." Altogether, the Carrier (and Tsé'kéhne) word designating that imported plant has the appearance of an old root of the second category, which is to me inexplicable.

Pipe Fig. 2 is of recent manufacture, and bears testimony to the Tsi|Koh'tin's faculty of imitation. It has been wrought out of an impure steatite or soap stone. Its stem is a wooden tube connected with the base of the bowl by a double string or chain of black beads. The stem of such pipes is more generally lengthened through the insertion of a perforated brass cartridge shell between the base and the mouthpiece.

Fig. 2.

Specimens of pipes identical in form, and sometimes in material, though many are of serpentine, are also found among the Tsé'kéhne. But now-a-days the poorest Carrier scorns them as utterly unsuited to his present state of civilization.

CHAPTER III.

STONE IMPLEMENTS.

Some scientists seem to have an innate fondness for the mysterious and the insolvable. Upon the slightest pretext they delight in creating difficulties or propounding problems. They long for novelties and must soar above the concepts of such weak-minded mortals as are naive enough to pay any attention to the "Hebrew myths" of the creation of man and his comparatively recent appearance on the scene of this world. Whereas in modern times we have no authentically recorded instance of mound building by American Aborigines,* and because some of those artificial works are of considerable magnitude, they jump to the conclusion that the so-called mound-builders must have been a very ancient race, more advanced in civilization than the Indians of our days and altogether different from them.† In like manner, because in Europe, and in some parts of America stone implements have been discovered which are of a particularly rude pattern, they infer that these remains being found in river beds or, in Europe, imbedded in geological strata supposed to have been formed at a very remote epoch prove the existence, not only of prehistoric, but even of pre-Adamite man. Students who prefer to rely on the authority of such an unerring guide as the Bible to following modern savants through their ever shifting, if not conflicting, theories, cannot but remark, I fancy, that, in the same way as the latest researches tend to confirm the opinion of those unprejudiced antiquarians who from the beginning doubted the great antiquity of the American mounds and the extraneous nationality of their builders,‡ even so it must ultimately

* As will appear from note ‡ the Cherokees did erect mounds, though unobserved by the whites, within the present century.

† "So strong in fact is the hold which this theory . . . has taken of the minds of both American and European archæologists, that it not only biases their conclusions but also moulds and modifies their nomenclature, and is thrust into their speculations and even into their descriptions as though no longer a simple theory, but a conceded fact." *Burial Mounds of the Northern Section of the U. S. by Prof. Cyrus Thomas; Fifth Ann. Rep. Bur. Ethnol.* p. 80.

‡ Evidence corroborative of this assumption would fill many pages. Scientists in every way qualified to speak on this subject and to whom nobody can refuse a hearing have clearly shown the futility of the theory which ascribes the erection of the mounds to non-Indian races. Prof. Cyrus Thomas, than whom I think there is no more reliable authority on the subject, lays down as one of the conclusions derived from the mound explorations under the auspices of the Smithsonian Institution that "nothing trustworthy has been discovered to justify the theory that the mound builders belonged to a highly civilized race, or that they were a people who had attained a

prove to be the case with regard to the fabulous age ascribed to what are called palæolithic implements. By the end of the last century Voltaire and his school were wont to adduce the pretended enormous antiquity of the Egyptian monuments as an irrefutable evidence of the inaccuracy of the Mosaical chronology. Time went on, and the days came when Champollion and Sir. H. Rawlinson deciphered the Egyptian and Assyrian inscriptions. Then the very same works which fifty years before were instanced as an excuse for the encyclopedists' sneers at the Scriptures were converted into the best extrinsical proof of the accuracy of the Mosaical account.

I am not an archæologist, much less a geologist. Yet, upon entering into a question in connection wherewith so many strange and, to me, evidently

higher culture status than the Indians. It is true that works and papers on American Archæology are full of statements to the contrary which are generally based on the theory that the mound-builders belonged to a race of much higher culture than the Indians. Yet, when the facts on which this opinion is based are examined with sober scientific care, the splendid fabric which has been built upon them by that great workman, imagination, fades from sight. . . The links discovered directly connecting the Indians and the mound-builders are so numerous and so well established that there should be no longer any hesitancy in accepting the theory that the two are one and the same people. . . The testimony of the mounds is very decidedly against the theory that the mound-builders were Mayas or Mexicans" *Work in Mound Exploration of the Bur. Ethnol., Washington, 1887, p. 11-13.* To corroborate by actual facts my position on this question, I glean from the same paper the following extracts:—"In another *Wisconsin* mound . . . was found lying at the bottom on the original surface of the ground, near the center, a genuine, regularly-formed gunflint. In another *Tennessee* mound some 6 feet high and which showed no signs of disturbance, an old fashioned horn handled case-knife was discovered near the bottom. . . From a group in Northern *Mississippi* in the locality formerly occupied by the Chickasaw were obtained a silver plate with the Spanish coat of arms stamped upon it, and the iron portions of a saddle. At the bottom of a *North Carolina* mound, part of an iron blade and an iron awl were discovered in the hands of the principal personage buried therein. . . At the bottom of an undisturbed *Pennsylvania* mound, accompanying the original interment . . . was a joint of a large cane wrapped in pieces of thin and evenly wrought silver foil, smoothly cut in fancy figures." *Ibid. p. 9 and 10.* I have underlined the names of the states mentioned to show that mound-building in post-Columbian times was by no means local or exceptional. To the above should be added the still more significant fact that in a small undisturbed mound in east Tennessee a stone with letters of the Cherokee alphabet rudely carved upon it was lately discovered by a party of American explorators. *The problem of the Ohio Mounds*, p. 37, note 1. Dr. D. G. Brinton in his latest work, *The American Race*, p. 87-88, admits that "there is, to say the least, a strong probability that they [the modern Muskokis] are the descendants of the constructors of those ancient works" [namely, the mounds in their vicinity]. Over and above the authorities already quoted, here is how Dr. J. W. Powell, the learned head of the Bureau of Ethnology, Smithsonian Institution, ends a review of an important paper by Mr. W. H. Holmes:—"This eliminates one more source of error cherished by lovers of the mysterious to establish and exalt a supposed race of Mound-Builders." *Third Ann. Rep. Bureau of Ethnology*, p. lxiii.; Washington, 1884. Nobody will deny that that gentleman, owing to his official position, enjoys opportunities of judging of the merits or demerits of a cause of which few indeed can boast. Lastly, it must be added that unlimited evidence goes to prove that in almost every case the modern Indians occupy the exact territory where their forefathers lived when they first came in contact with the whites.

false theories have been built, I feel the necessity as a Christian and an observer of my own surroundings to put on record my utter disbelief in any proposition which may run counter to the natural deductions from the Book of Genesis. True, even Christian anthropologists are far from agreed as to the probable age of man, since such a learned orientalist as the Abbè Vigouroux suggests* and Father Thein inclines to believe† that creation dates from over 8000 years as against the 6000 which it was customary to reckon as the maximum distance which separates us from Adam. Yet methinks that there are limits beyond which modern interpretation of the sacred text cannot safely go. I suppose that no person who has any regard for the authority of the Bible—I am tempted to add, and for sober, common sense‡—will believe in the hundreds of thousands of years attributed by some to palæolithic stone implements and consequently to man. To show that there are valid reasons to doubt the correctness of such chronological computations, let me adduce here a few facts derived from the very source to which they are wont to point in confirmation of their extravagant theories, I mean Geology.

The great antiquity attributed in Europe to stone implements is based generally on the age of the geological strata wherein they are found. For the sake of briefness, let us choose those the formation of which is the most easily accounted for, say the alluvial strata. Pieces of pottery found at a depth of thirty-nine feet in the mud of the Nile delta were pronounced by antiquarians of repute to be 13,000 years old. Such authorities as Sir John Lubbock and Sir Charles Lyell asserted in various papers that those Egyptian relics must date back from 12,000 to 60,000 years. Now, Sir R. Stephenson found at a *greater* depth in the delta, near Damietta, a brick bearing on its surface the stamp of Mohammed Ali! § The discoverer of the pieces of pottery "rated the growth of the mud deposit in a given spot at only three and a half inches in a century;

---

* *Les Livres Saints*, etc., Vol. III., p. 238.

† Christian Anthropology, p. 245, New York, 1892.

‡ For my own justification and to illustrate the vagaries of some modern scientists, let me recall the fact that from the supposed vestiges of man discovered in the strata of the tertiary period, some geologists assign a date of at least 300,000 years before the beginning of the historic epoch. Now a clever Italian writer who has made an arithmetical computation of the number of men who must have been existing on the earth at the time commonly assigned to the creation of Adam according to that hypothesis, finds that this number cannot be expressed without 434 figures! Suppose the habitable part of the earth extended in a series of stories each one meter in height and filled with men in the ratio of 10 to each square meter as far up as 400 times the radius of the moon's orbit and the limits of the earth's orbit will be reached and yet the number of these men will be represented only by the figure 2 followed by 26 ciphers.

§ Christian Anthropology, p. 267, New York, 1892.

but a description of the same spot by a Mohammedan writer only six centuries ago shows that the mud is deposited at the rate of over eighteen inches in a hundred years."*

An English resident in India recounts that the foundation of a house he had himself built was carried away and strewed along the bottom of a river at a depth of thirty or forty feet below the level of the country. "Since then the river has passed on," he says, "and a new village now stands on the spot where my bungalow stood, but forty feet above the ruins; and any one who chooses to dig on the spot may find my *reliquiæ* there, and form what theory he likes as to their antiquity or my age."†

Again, antiquarians of a geological turn of mind should remember, it seems, that in most cases the agents which now produce alluvial deposits were formerly many times more powerful and that therefore strata containing archæological relics were formed at a proportionately greater rate. Take, for instance, the valley of the Somme in France. No region has probably become so famous in the Annals of Archæology. The Somme is to-day a modest river with very quiet waters. Now, according to M. de Mercey, who has made a careful study of its history, its waters at the Roman epoch were fifty times more abundant than in our days.‡ Moreover, it is a well established fact that the sea at that time must have extended to Amiens, since below a marine deposit nine feet thick coins have been found, the most recent of which bears the effigy of a prince who died A.D. 267.§ In the neighbourhood of Lille, a medal of Marcus Aurelius was found at a depth of twenty-five feet under a triple bed of reddish clay, muddy slime and peat mixed with sand.‖

Thus Geology refutes itself the theories of the partizans of the great age of the primitive stone implements, theories which they claim to base on geological grounds. Let us now see what History has to say on the same subject.

The contention of the majority of antiquarians is that the stone age long antedated the historic period. In opposition to this, O. Fraas states that "arrows with sharp flint heads, and especially stone axes, stone chisels and stone hammers are found among the Germans, even down to the time of the Franks. . . . According to Herodotus, Ethiopians

* Southall, Recent Origin of Man, p. 474.

† Quarterly Journal of the Geological Society, p. 327, Aug. 1863.

‡ *Bulletin de la Société Géologique*, 1876-77, p. 347.

§ Christian Anthropology, p. 260, New York, 1892.

‖ *Matériaux pour l'histoire de l'homme*, p. 136, 1878.

accompanied the army of Xerxes, who were so savage that they possessed only weapons of stone and bone . . . ; they had long bows made of the ribs of palm leaves and reed arrows with pebble points; their javelins were pointed with the horns of gazelles."* Five hundred years later, Tacitus says of the Fenni: "They have no (iron) weapons. Their only means of attack are arrows to which, having no iron, they give a bone point."† Cæsar tells us in his *De Bello Gallico* ‡ that the Gauls, while besieging Alesia (52 B.C.), made use of stones and pebbles. An epic poem of the fifth century describes two warriors battling with stone axes.§ St. Ouen, bishop of Rouen in the seventh century, speaks of flint hatchets in his "Life of St. Eligius." As far down as 1066, projectiles of stone were in use in Europe according to William of Poitiers. It even appears that more than a century later the Scots of Wallace made use of stone arms. ||

History records many other similiar examples. I am well aware that the advocates of the great antiquity of man and human implements base their views on divers other reasons. But I think that all of these can be as easily disposed of.

INDUSTRIAL IMPLEMENTS.

The facts above recited are necessary to establish the really modern origin of many stone implements which some regard as absurdly ancient, and therefore if, in the course of the present monograph and more particularly of this Chapter, Dené implements or weapons are occasionally assimilated to objects, even palæolithic, of the same description found in the alluvial strata of Europe, my comparisons, instead of appearing preposterous, should be construed as additional evidence of the relatively recent origin of the European "finds." For, I cannot help thinking that some spear heads, for instance, which were in use here but one hundred years ago are identical in form and finish with weapons of the Solutrian period of the unpolished stone age. As for the industrial implements, and especially the axes of the prehistoric Dénés, though they might not perhaps be classed with strict propriety among palæolithic implements, I think they could not properly be styled neolithic, since they were mostly unpolished, except at the cutting edge.

---

* *Die alten Höhlenbewohner*, p. 30.

† *Apud* Christian Anthropology, p. 320.

‡ Book VII., 81.

§ *Ampère, Histoire littéraire.*

|| Christian Anthropology, *passim.*

Thus in fig. 3 we have a celt of a dark coloured, very close-grained rock which shows absolutely no sign of polish except at the cutting edge and, if I am to credit the Indian from whom it was obtained and who used it for some time as a skin scraper, even this faintly polished edge was wanting when the instrument was found on the surface of the ground. It would seem that these rude, unpolished axes were, at least among the Carriers, much more common than those entirely or even partially polished.

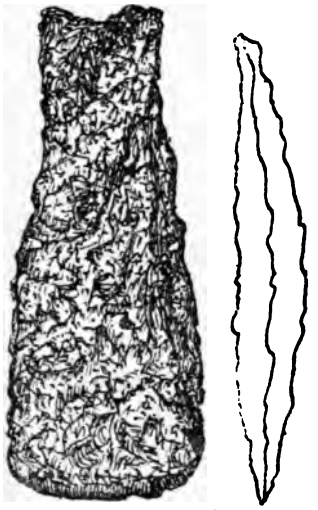


Fig. 3. ½ size.

Fig. 4. ½ size.

Fig. 4 hardly exhibits any trace of improvement on that primitive pattern. Indeed the specimen it represents has even cost the maker a smaller amount of exertion, since one of its flat surfaces is merely the original surface of a blackish siliceous stone in its natural water-worn state, while the reverse is evidently the result of the splitting of the pebble out of which the implement has been made. Were it not for the unmistakable attempt at obtaining by friction a finer edge than is usual in scrapers, one would almost suppose that it has been designed for dressing skins rather than cutting wood.

The specimen illustrated by fig. 5, though unpolished except at its broadest end, is more axe-like in shape. It is of a shaly rock externally rusty-looking, but internally of a reddish gray transversely striated with fine parallel lines.

The implement represented by fig. 6 again differs both in form and material from all the preceding specimens of stone axes. It might be described as gouge-shaped, were itnot that no concavity corresponds to the convex exterior. No attempt at diminishing by friction the bulging surface of the stone has been made; its main asperities only have been

polished off. It is of a gray basaltic rock, regularly wood-veined and very hard.

Fig. 5. ⅓ size.

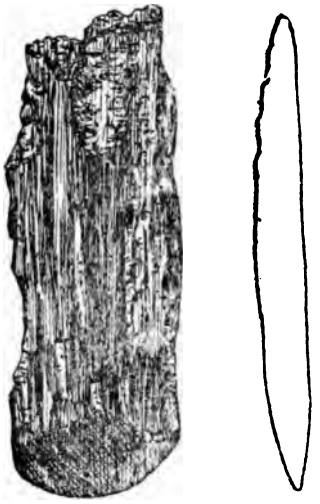


Fig. 6. ½ size.

Here (fig. 7) we witness a sort of transition between what might perhaps be called the medio-palæolithic and the neolithic types, in that this adze-blade has been treated to a partial polish elsewhere than at its edge.

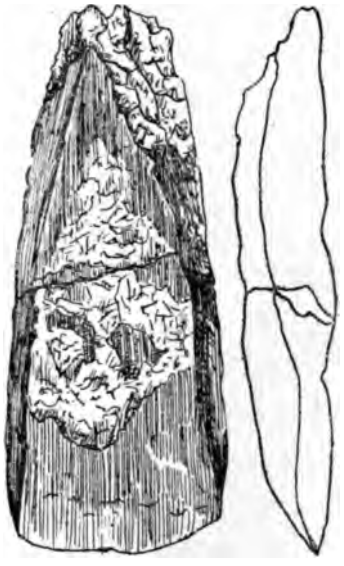


Fig. 7. ⅓ size.

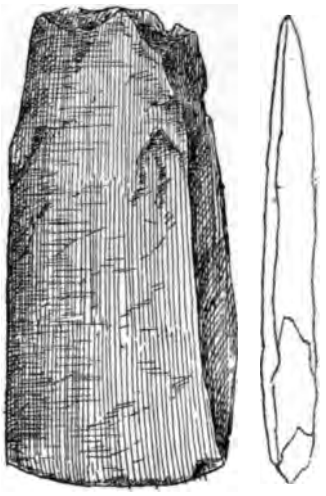


Fig. 8. ⅓ size.

It is of a fine-grained volcanic rock which has been rendered rather hard by pressure subsequent to its original cooling. It is disproportionately thick and fully 8½ inches long.

All these differences in type and material are suggestive of what appears to be a well established fact, namely that the Western Dénés had no fixed standard in view when engaged in the manufacture of their adze-blades. Any stone of sufficient hardness and consistency was probably picked up, and after a rough blocking off, was given as sharp an edge as the material was susceptible of acquiring by means of the least possible exertion. No attention whatever seems to have been paid to the details and no regard manifested for the elegance of the implement.

This remark applies to adze-blades of genuine Déné origin. But the Carriers, especially the more prominent members of the tribe, possessed much finer axes of which fig. 8 is a fair example. This is a thoroughly polished stone axe. In shape and material it is typical of all the polished implements of that class. They are, as a rule, of a greenish gray rock identified by Dr. G. M. Dawson as fine felspathic slate or falsite. Although they were extensively used among the Western Dénés, it would hardly be consistent with truth to credit the latter with their manufacture. Indeed I am rather inclined to believe—and this is borne out by the declarations of living aborigines—that, in so far at least as the Carrier tribe is concerned, most of them were imported from among the neighbouring tribes. The Carriers of the old stock were exceedingly poor workmen, and their old men are unanimous in asserting that their best axes were bartered from the Tsé'kéhne and the sea-coast Indians. It is therefore quite possible that the implement above figured had an extraneous origin.

Fig. 9.

All these various types of axes were hafted to a handle generally of

black thorn,* *Prunus spinosa*, as is shown through fig. 9. The adzes thus obtained never had a cutting edge fine or hard enough to serve crosswise against wood, and the axeman's strokes had always to be directed obliquely.†

It must be noted also that, among the Carriers, such instruments were possessed by the notables and a few wealthy heads of families only. The common people had recourse to fire to cut their provision of wood. After having freed the main roots of a tree of the earth adhering thereto by means of slight excavations underneath, they would light there a small fire with vegetable matter with the result that the tree would inevitably topple over at the latest on the morrow thereafter. Then the smaller limbs were trimmed off either with a hard stick, with a stone club if any was at hand, or, among the Babines, with a bone or horn implement specially fashioned for the purpose. Smaller trees were next crossed over the trunk at the proper intervals to give the desired length to the pieces of wood, after which a fire was started at each point of intersection and maintained by the children or the women until both the larger and the smaller trunks were burnt asunder.

If too bulky to easily burn in the fire-place, the wood was then split with the help of wedges and a roughly formed wooden maul. Except among the TsiɿKoh'tin, the stone hammers and sledges so common among the coast Indians were unknown. For peculiarly heavy work such as sinking down the stakes on the solidity of which depends the firmness of the salmon weirs, they sometimes did, and even now do, use such elongated stones as bear the greatest resemblance to their *hwot'səz* or wooden maul; but these are never pecked or fashioned into regular sledges.

Fig. 10.

The Carriers' wedges‡ were either of hard wood, of the part of the

* In Carrier *Rwəs-tco*, "big thorn."

† The axe is called *tseɿ* in TsiɿKoh'tin, *tséɿ* in Tsé'kéhne and *tsiɿ* in Babine; whilst, curiously enough, the Carriers now call it, and seem to have done so as long as any old man can remember, *tsé-tsiɿ*, or stone-axe. Nevertheless, the Déné name of this primitive implement is evidently *tseɿ* or *tsiɿ*, a primary root.

‡ *Yiɿ*, pr. root.

cariboo horns next to the skull of the animal, or, in some cases, of stone (Fig. 10).

Fig. 11.

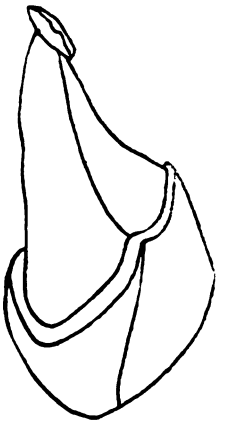


Fig. 12.

The implement illustrated above (Fig. 11) is a pestle* of a coarse variety of quartzite, of which Fig. 12 gives a side view. The lower half of the instrument has been left undisturbed by the artist, the handle only being pecked and smoothened to a fine enough finish. This pestle did service among the Babine Indians.

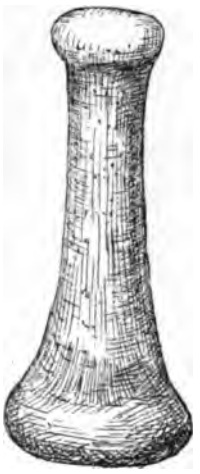


Fig. 13. ⅓ size.

Fig. 14. ½ size.

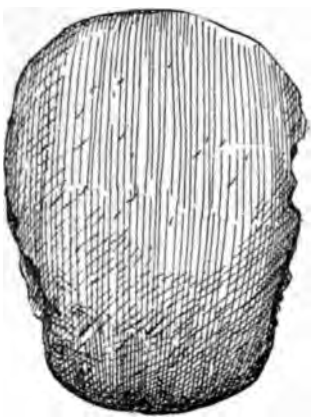


Fig. 15. ½ size.

A very different model is shown in Fig. 13, wherein we have an implement of Tsi|Koh'tin origin. It served a double purpose, being at

* *Pe-atsal*, "wherewith one pounds," v. n.

the same time a pestle and a hammer.* But the mode of using it was identical in both cases; the contact between the matter pounded or hammered was only at the bottom of the larger end, the hand grasping the instrument in the middle. I have witnessed old men working with such stone hammers among the Skwahomish† with whom the Tsi|Koh'tin have occasional intercourse.

All races of American Aborigines are proverbially improvident, and our Western Dénés cannot be said to form an exception to the rule. Yet these very implements, when used as pounders or pestles, testify to the fact that the Carriers at least had at times a thought for the morrow. In times of plenty, they pounded therewith dried salmon previously well grilled by the fireside, and kept the mash in a *tcaɟyaɟ*, one of their bark vessels which shall be described further on. When this had been sprinkled over with salmon oil, the vessel was hermetically closed and the whole laid aside for use when, owing to the failure of the fishing season or any other cause, the natives were hard pressed by famine. Under similarly strained circumstances, salmon bones, or indeed the bones of any animal, were, and are, also likewise treated, and made to obviate similar needs.

Fig. 16.

Here (figs. 14 and 15) are slickstones or stone scrapers,‡ which serve in the process of tanning hides. As may be seen, they are of a very primitive pat-

* *Pe-ɔlt'ɟɔz*, "wherewith one pounds or hammers," a verbal noun.

† The Sk·qō'mic of Dr. Boas.

‡ *Pe-ɔltzɬh* "wherewith one scrapes" in Carrier; *tsé-tqél*, "stone-broad" in Tsé'kéhne.

tern, and neither of the two evidences any regard for elegance. And yet they are fair representatives of their class, even of those which are still in use among the modern Carriers. They generally consist of flat halves of oblong pebbles one end of which has been slightly trimmed by chipping with a hard stone. The object of such implements being to soften by repeated pressure the hide which has already been stripped of its hair and adherent blood and fat, these scrapers receive no polish whatever. This is why I rather hesitate in classing among the skin scrapers the instrument represented by fig. 16, which is a "find," and was not, like those above figured, in actual use among the natives when handed to me. It is of a very fine grained black volcanic rock polished at the broadest end *a*, and as it is drawn natural size, it is, if any, the smallest skin scraper I have ever seen.

Fig. 17.

Most of these tools have received very little artificial treatment in their manufacture. In fact, they are almost invariably made as follows: any flat pebble which is likely to split as desired and thus yield easily suit-

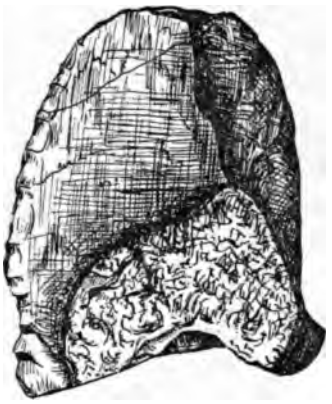


Fig. 18.

able material for the intended scraper is secured up between two stones on the ground and then split asunder by vigorously throwing a large stone on its upper end. The half which best answers the purpose in

view is then trimmed to the proper shape by chipping off any too prominent asperities, or blunting the edges, should these prove too sharp.

The scraper is finally hafted, as shown herewith, by inserting it in the cleft end of any stick at hand over which a rope or buck line is securely lashed. This hafting is but temporary, as the stone part only of the implement is usually kept among the family chattels.

To the unthinking reader unmindful of the straits to which man may be reduced in the absence of the proper material and while too hard pressed by more urgent needs to look for it, the above (Fig. 18) might not be more than a useless piece of quartzite. But an experienced archæologist will not fail to detect therein unmistakable signs of human handiwork, and its fine, if somewhat serrated edge will at once suggest that it did formerly duty as a cutting tool. It is a salmon knife, which served first to rip the fish open, and then to cut longitudinal furrows through its flesh previous to exposing it to the action of the air. The large flaking noticeable near its blunt end is not accidental, but served as a grip for the thumb, while the index and medius fingers rested respectively on the back or thick side and on the reverse surface of the implement.

Fig. 19.

Fig. 20.

Figs. 19 and 20 represent stone knives* of different pattern and use. They are skinning knives and their material is augite-porphyrite.

* The Carrier word for "knife" is the same as that for "iron," viz., *ɔɛthih* in Upper Carrier and *ɔthés* in Lower Carrier.

Both are drawn natural size and their cutting edge is at the fore-end. Knive fig. 19 was used without handle, but fig. 20 was hafted to a short stick as is manifest from the side notches discernible therein. The identity of these instruments is beyond the possibility of a doubt, as it has been established by the testimony of an old Indian who used himself similar knives in his youth when no better ones were obtainable.

The most serviceable and therefore most highly priced working or carving knives in use among the prehistoric Dénés were nothing more or less than beaver teeth sharpened when necessary, by friction on a hard stone. But owing to the perishable nature of the material, none is now available for illustration. The only stone carving knife which has ever fallen under my observation is that herewith figured (fig. 21). I believe it to be of genuine black flint. The cutting edge is at *a* and it is still very keen. Notches at *b* and *c*, though slight enough, appear nevertheless to be quite intentional, and were it not for the symmetrical rounding off of the broadest end, they would suggest a double handle as the original means of facilitating work therewith. The Indians neither account for these notches, nor satisfactorily explain the mode of handling the knife.

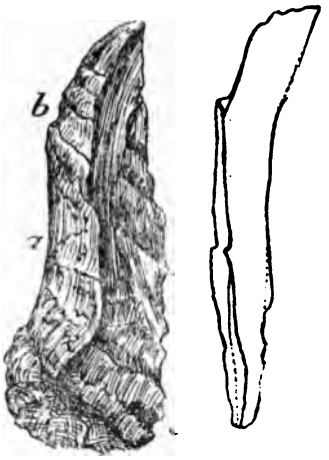


Fig. 21. ½ size.

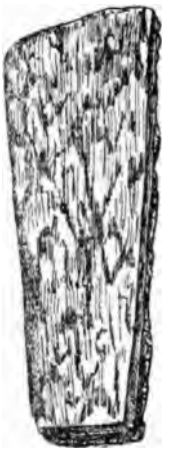


Fig. 22. ½ size.

Fig. 22, represents a picece of broken object the original use of which is likewise problematic. It is of a variety of green marble variegated with yellow and rusty red. The broadest end has been thinned to a dull edge and, except where it shows signs of accidental breakage, it has received an exceedingly fine polish. Indeed, though it has been found here, at Stuart's Lake, I believe it far too skillfully finished to be of Déné manufacture. It must have been imported from the Coast. But

what renders this relic particularly remarkable is the presence of the very fine grooves noticeable on each of its three unthinned edges, two only of which appear in the cut above, the third being on the reverse of the implement. This peculiarity, while rendering the identification of the find more difficult, suggests a similarity of form though certainly not of use, with an implement formerly common among the Carriers under the name of *ɔzih*, "it grinds through." It consisted of two stone tablets carefully polished at least on one side so as to permit of their being closely joined together. In the middle of their polished surfaces was a groove obtained probably by pecking, not friction, which when both tablets were superposed formed a cylindrical hole through which gambling sticks, arrow shafts, etc., were repeatedly passed and thereby given an exquisite finish. None of these implements is now extant. They were the equivalent of the wooden wrenches used by the Hupas under similar circumstances.

WEAPONS OF WAR AND OF THE CHASE.

Prominent among these were, of course the arrow,* and its correlative the bow.†

The arrow heads‡ of the Western Dénés were either of stone, of bone or horn, or of wood. The form, no less than the material, of the stone arrow points greatly differed. In fig. 23 will be found specimens representative of the most common patterns. Many of them are quite diminutive in proportions, and would seem to partake more of the nature of play-things than of that of the deadly weapons they undoubtedly were. As regards shape, those marked *a* and *b* may be described as the typical arrow-points of the Western Dénés. In common with specimen *c*, whose main peculiarity is the absence of one of the usual side notches, they are of a blackish resonant rock which I long mistook for a variety of flint, but which Dr. G. M. Dawson declares to be a very fine grained augite-porphyrite. The Carriers call this stone *pîs*, and it is one of the 16 varieties of rocks known to their vocabulary. They used it in the making of the largest number of their missile weapons, arrows, spears, etc. It is but right to remark here that the point *a* is so much larger than most genuine Dené arrow heads, that some Indians claim it was a bow, not an arrow point. Of the bow points further mention will soon be made.

---

* *'Kra*, prim. root.

† *ɣɟthi*. Singularly enough the Carriers have a collective name for bow and arrow taken together. This is *'Kra-zza*.

‡ *Nântai*, second. root.

A less common and more valued material, called *nəlre* in Carrier, is the obsidian of which the arrow-point marked *d* is formed. Such points are generally very small. *e* represents the most beautiful of all the arrow heads in my possession. It has been ingeniously chipped of a hard crystalline rock identified by Dr. Dawson as smoky quartz. Its form and

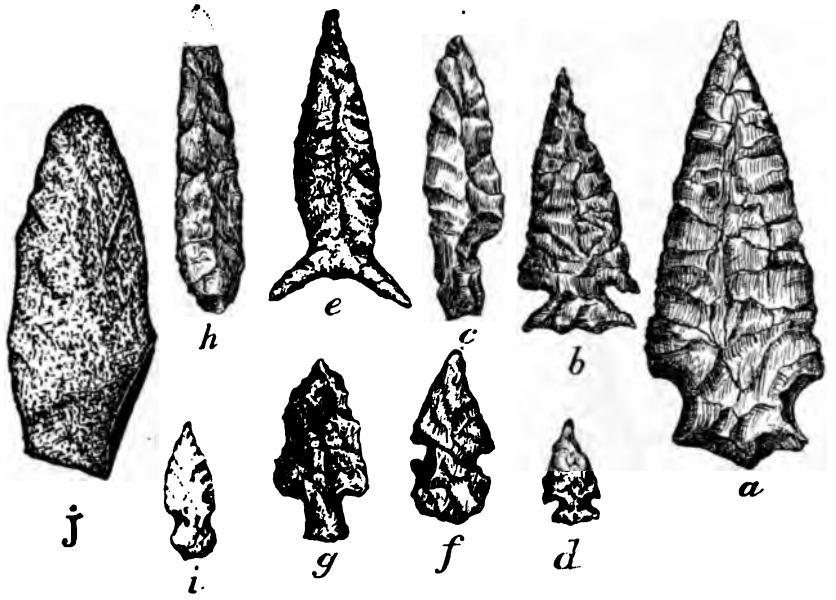


Fig. 23.

finish display evidences of exceptionally good workmanship, too good in fact to be Déné; and I cannot help supposing that it must be some relic left among the Carriers by some coast warrior after one of those many conflicts recorded in the traditions of the old men. Other points, such as those labelled *f*, *h*, are of a species of translucent vitreous rock which probably does not essentially differ from that of specimen *e*.

That marked *h* is remarkable for the absence of both notches. It is long, narrow, and so thick that but for its intentionally thinned edges it might be taken for a drill point. A few arrow heads as that marked *g* are of chalcedony, *tsé-lkrai* (stone-whitish). They are as a rule of a rather rude description.

All the above are drawn full size. Specimens *d* and *i*, when seen otherwise than on paper, appear very small and tiny indeed. Yet it would be erroneous to suppose them to be mere anomalies or exceptions. Judging from the number of Déné arrow heads in my collection, such diminutive implements form at least one quarter of all the arrow heads now extant.

Lastly, a few points are of a black, very hard and fine-grained stone, differing from the material of all the arrow heads already described. Such is that marked *j*. It is the only one of that description which I have ever seen. It is blunt-tipped, and with hardly any edge or sign of flaking. It has the exact appearance of an implement very much the worse for wear.

There are to-day no well-authenticated Western Déné arrow-heads of bone or ivory in existence. Their tip was not pointed like that of the stone weapons. They were mere beaver teeth in their natural state secured to a shaft. Some of these were also of the root part of the cariboo's antlers, and both bone and horn arrow-tips were considered exceptionally effective.

Fig. 24.

Fig. 25.

In Figs. 24 and 25 I have tried to illustrate the modes of connecting the stone points with the shaft, as formerly practised by our aborigines. Sometimes the shaft was simply cleft open to receive the point (Fig. 24), and sometimes it was slit at the end as in Fig. 25. In either case, point and shank were firmly fastened together with sinew and pitch. The foreshafts used along with the arrows of some American races were unknown here.

The shaft* of the Western Déné arrows was invariably of seasoned amelanchier *(A. alnifolia)* wood. As partially visible in Fig. 25, delicate grooves, one on each opposite side, ran through the shank of the weapon and were intended to facilitate the detection of the game when it had been only wounded. The blood issuing from the wound, by flowing

* Kɔs, a primary root.

freely through these grooves, dropped on the snow or bare ground in a less-scattered condition, thus aiding the hunter in tracking the animal ere it was finally dispatched.

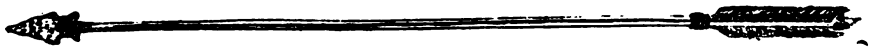


Fig. 26.

Fig. 26 gives a fair idea of a Carrier arrow ready for use. As may be seen, the feathering is triple. The tips only of the feather quills are fastened to the shaft. Sinew and pitch were restored to in order to secure the part of the quills adhering to the shaft end, while sinew alone generally sufficed to fasten the larger or root end of the feathers.

A variety of arrow* which was entirely of amelanchier wood without stone or bone point or shaft grooves did service in connection with target practice or one of the games which shall be described further on. (Chap. VI.)

The Tsé'kéhne, who to this day live almost entirely on the spoils of the chase, formerly far excelled the Carriers in the manufacture and use of hunting weapons. Some of these, which were indeed in actual use among the Carriers, were nevertheless of undisputed Tsé'kéhne origin. Such were the "cut arrow," the triple headed arrow and the blunt arrow.

Fig. 27.

The "cut-arrow" (*'kra-tcɔn-kwɔ̨*, lit. "arrow-stick-cut off") was so called on account of its peculiar shape (fig. 27). Its point was made of a cariboo horn and "was awl-like in form. Its broader extremity was hollowed out to receive a wooden shaft which served to dart it off from the bow as a common arrow, with this difference however that, when in motion, the horn point detached itself from the shaft. This projectile was deadly, and intended only for use against a human enemy or for killing large game."†

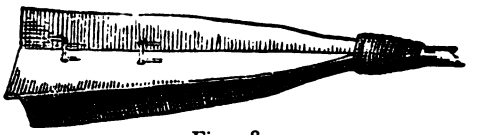


Fig. 28.

To shoot smaller game they had recourse either to the triple headed

* *'ke-squh*, verb. noun, meaning as far as it can be translated: "it shoots in as far as the feathering."

† The Western Dénés, etc. Proc. Can. Inst., Vol. VII., p. 140.

arrow shown in fig. 28, or to a wooden blunt arrow (fig. 29). The former* consisted of three flat pieces of bone, or more generally horn, cut transversely at their broadest extremity and fastened to the shaft through their smaller end and sides by strong sinew threads. It did good service even against large animals, and it is not more than 40 years since it has entirely fallen into disuse.

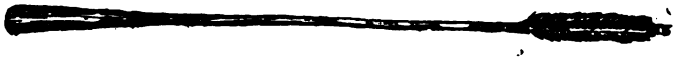


Fig. 29.

The latter† has been drawn from a specimen obtained from a Tsé-'kéhne who, in common with the majority of his fellow huntsmen, to this day finds this simple and primitive looking projectile invaluable against grouse, rabbits, etc.

Even such an apparently insignificant act as that of releasing the arrow while shooting has been analyzed so as to yield modern scientists material for ethnic divisions. Professor Morse thus classes the different methods in vogue among American, European or Asiatic archers :—

(1) *Primary.*—The notch of the arrow is grasped between the end of the straightened thumb and the first and second joints of the bent fore-finger. It is practised by children generally, and by the Ainos, Demeraras, Utes, Micmacs, etc.

(2) *Secondary.*—The notch of the arrow is grasped with the straightened thumb and bent fore-finger; while the ends of the second and third fingers are brought to bear on the string to assist in drawing. Practised by the Zunis, Ottawas, etc.

(3) *Tertiary.*—In this release the forefinger, instead of being bent, is nearly straight with its tip as well as the tips of the second and third fingers, pressing or pulling on the string, the thumb, as in the primary and secondary release, active in assisting in pinching the arrow and pulling it back. It is practised by Sioux, Arapahos, Cheyennes, Assiniboins, Comanches, Crows, Blackfeet, Navajos, Siamese, Great Andamanese.

(4) *Mediterranean.*—The string is drawn back with the tips of the first, second and third fingers, the balls of the fingers clinging to the string with the terminal joints of the fingers slightly flexed. The arrow is lightly held between the first and second fingers, the thumb straight and inactive. Practised by nations around the Mediterranean, by modern

* *Tarwɔs*, second. root.

† *Thɔs.*, prim. root.

archers, Flemish (using first and second fingers only), Eskimos, Little Andamese.

(5) *Mongolian.*—In this release the string is drawn by the flexed thumb bent over the string, the end of the forefinger assisting in holding the thumb in position. The thumb is protected by a guard of some kind. It is practised by Manchus, Chinese, Coreans, Japanese, Turks and Persians.*

Our Carriers followed the first or primary method of arrow release, while the Tsé'kéhne conformed to the fourth or Meditterranean. I am not acquainted with that in vogue among the prehistoric Tsi|Koh'tin. The above details are given to show to what advantage even the slightest differences in the performance of an act common to all primitive peoples can be turned by the acute observer and reflecting scientist.

Although the scope of this paper, to be consistent with its heading, should be restricted to stone implements, I feel that I cannot well separate bows from arrows in my treatment of the weapons of the chase. As far as my information goes, three varieties of bows, exclusive of cross-bows, obtained among the Western Dénés. Of these two were proper to the Tsé'kéhne, and the third to the Carriers and probably the Tsi|Koh'tin as well.

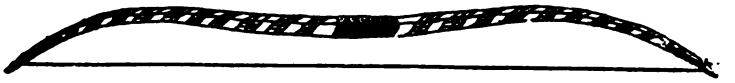


Fig. 30.

The regular hunting or war bow of the Tsé'kéhne was of mountain maple (*Acer glabrum, Tow.*) and five feet and a half or more in length. The edges, both inner and outer, were smoothened over so as to permit of strips of unplaited sinew being twisted around to ensure therefor the necessary strength. These pieces of sinew were fastened on with a glue obtained from the sturgeon sound, which also did service for all kinds of gluing purposes among each of the three tribes, while still in their prehistoric period. The central part of the bow, which was so thick as to appear almost rectangular, was finally covered with a tissue of differently-tinged porcupine quills.

Great care was taken to obtain a bow-string impermeable to snow and rain. With this object in view, delicate threads of sinew were twisted together and afterwards rubbed over with sturgeon glue. This first string was then gradually strengthened by additional sinew threads twisted round the first and main cord, each overlaying of sinew being

* See Anthropology in 1886, by C. T. Mason, p. 538.

thoroughly saturated with glue. Finally when the string had attained a sufficient thickness for efficient service, it was repeatedly rubbed over with the gum of the black pine (*Abies balsamea*).

Fig. 31.

A less elaborate bow (Fig. 31) is still to this very day in use among the Tsé'kéhne in connection with the blunt arrow already mentioned. It is of seasoned willow (*Salix longifolia*), and being devoid of any sinew backing or other strengthening device, its edges are more angular than those of Fig. 30. Its string consists merely of a double line of cariboo skin slightly twisted together. The specimen figured above measures four feet ten inches.

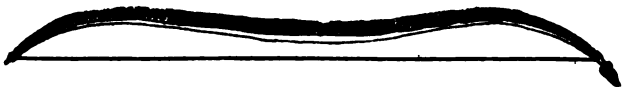


Fig. 32.

The Carrier bow was never much more than four feet in length, and the wooden part of it was invariably juniper (*J. occidentalis*). Instead of being twisted around as in the Tsé'kéhne bow, the shreds of sinew were glued on the back after the fashion of the Eskimo bow, with this difference, however, that in the Carrier weapon the sinew was not plaited. When a layer of thin sinew strips had been fastened lengthwise on the entire back of the bow, it was allowed to dry, after which others were successively added until the desired strength had been obtained. A process analogous to that whereby the Tsé'kéhne bow-string was made was followed in cording the string of the Carrier bow.

It is hardly necessary to remark that both of the aforesaid war and hunting bows disappeared almost simultaneously with the establishment of the North-West Company's posts throughout Western Déné territory. However, it may be said that as late as 60 years ago fire-arms were still *desiderata* among the poorest class of Aborigines.

Here is a Tsé'kéhne crossbow* of modern manufacture. It does duty against small game or for target practice, and is also used by children as a plaything. Although the old men assure me that they have always seen such weapons among their fellow huntsmen, I cannot believe that cross-bows were known to the original Tsé'kéhne. It is much more probable that they have been derived from the band of Iroquois established in close proximity to the territory of the Beaver Indians. My purpose in

* *Tl'kos t*, "that which darts off," in Tsé'kehne.

mentioning them here is to show that the faculty of self appropriation and adaptiveness which more particularly characterizes the Carrier mind,

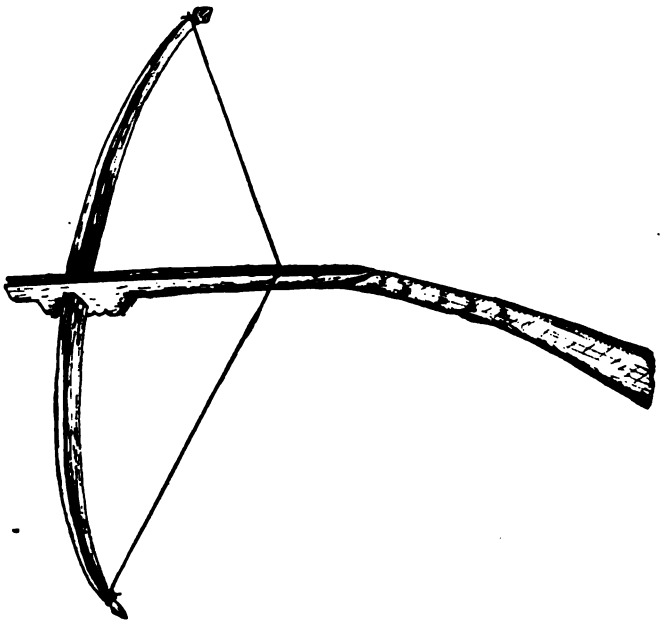


Fig. 33.

is, to some extent, shared in even by the Tsé'kéhne tribe which to this day has little reason to boast of its material progress.

A detail which it may also be worth noting is the mode of holding the bow while shooting. The Carriers, who almost invariably knelt while shooting, held it in a horizontal position, while the Tsé'kéhne used it perpendicularly, one end of the weapon resting on the ground.

To return to stone implements. Besides the arms already described the Western Dénés had recourse, when on the offensive, to five other varieties of weapons; the spear, the dagger, the war club, the temple-lancet or skull-cracker, and what might be termed the counterpart of the modern bayonet.

This latter arm was called *əɿthi·-la-dîn·ai** which may be freely translated "fixed at the end of the bow." Its name explains its nature. It was brought into requisition by the warrior or the hunter when too closely pressed by the enemy to shoot, and was used as a spear. Such points were of identical material with that of arrow-heads, *a*, *b* and *c*, fig. 23, and were chipped to the shape of figs. 34 and 35. The latter point is rather ruder in appearance than the average bow-points. Indeed from

* Lit. "bow-end-appended to;" plural. *əlthi-la-dînla*, a verbal noun.

the cut giving a side view of it, it would seem that it had been left unfinished. These weapons were inserted in a slit at one end of the bow

Fig. 34.

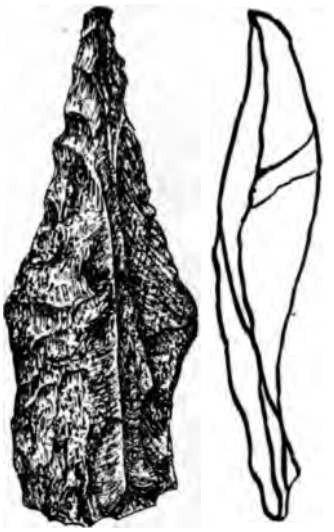
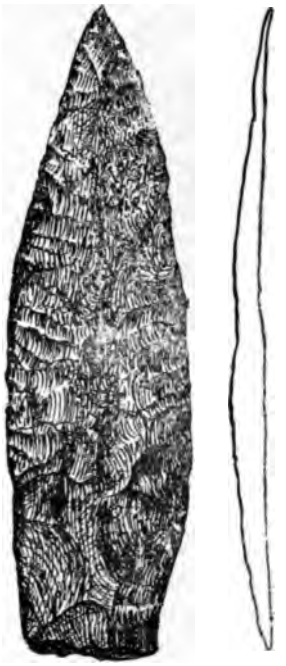


Fig. 35.

(fig. 32) and securely fastened therein with pitch inside and pitch and sinew outside.

Fig. 36, ½ size.



Fig, 37, size.

The spear heads * in nowise differed from the bow-points, save perhaps that they were generally larger in proportions and narrower at the base. Herewith are shown representative specimens. Fig. 37 is, by exception, of felspathic slate. Its shape and make would suggest to the archæologist a comparison with the laurel leaf points of the so-called Solutrian epoch. It is drawn full size. One of its surfaces shows hardly any trace of flaking and almost perfectly flat.

In fig. 38 we have a type of a very different description. It lacks the exquisite finish of the preceding and is double-pointed, so that the base is not easily distinguished from the tip. As may be seen from the outlines of its side, its shape is far from elegant.

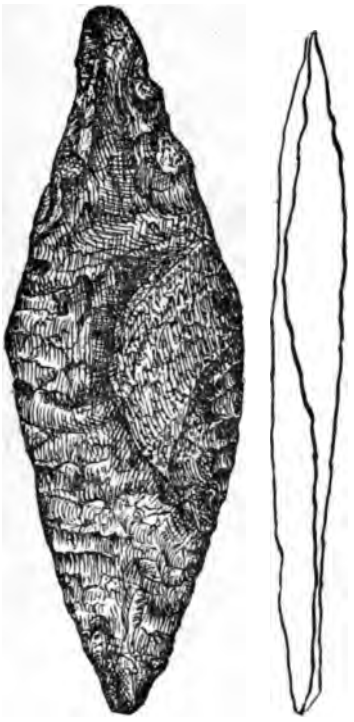


Fig. 38.

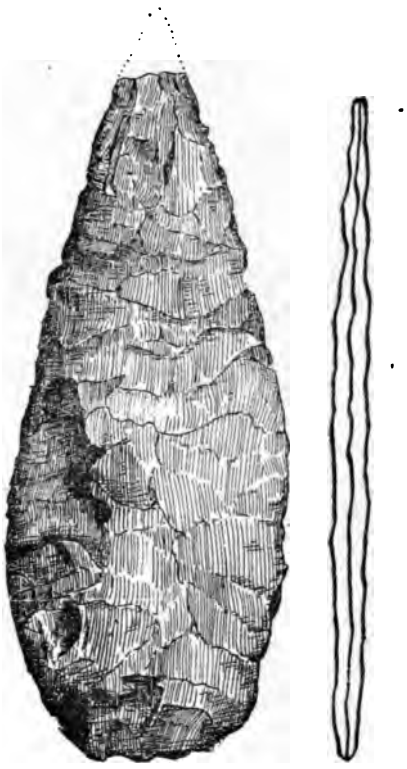


Fig. 39.

All of these spear heads were hafted to a pole five or six feet long pretty much after the mode of connecting the arrow heads with their shaft.

* The heads of these and all missile weapons are called *nântai'*. The spear, shaft and point, is named in Carrier *sɔR-thɔz*, or "hook-staff."

To all appearances, the stone daggers* of the prehistoric Dénés were distinguished from their spears by two peculiarities: the shortness of the handle and the greater dimensions of the blade. I would call the attention of antiquarians to the size, shape and finish of the above illustrated dagger blade (fig. 39). Although evidently broken off at the tip end, it is still fully 8½ inches in length and 3 inches in width. Yet it is not more than ⅜ of an inch in its greatest thickness. It has been chipped off to an almost perfectly flat surface, the flakes being as in the Solutrian implements remarkably large and shaving-like. Nevertheless this exquisite relic of prehistoric workmanship has been found, not in the cavern of Solutré, but scarcely two hundred yards from where these lines are written. I may add that it was found on the surface of the ground† and is of exactly the same material as the great majority of Déné arrow heads.

The Déné dagger was carried about hanging from the belt through a a leather thong, as is now done with its modern substitute, the steel poniard.

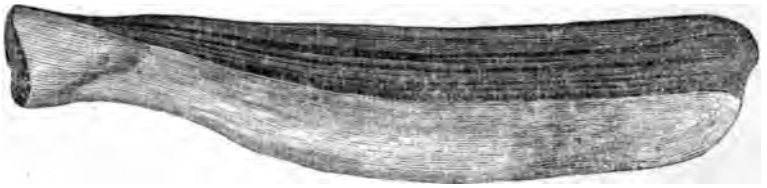


Fig. 40. ⅓ size.

* *Mecyal*, second cat.

† The foregoing had been written for some time when I came across the following passage of Mr. D. Boyle's Archæological Report for 1891 (p. 10) which I had overlooked in the haste of the first reading: "While many specimens (especially flaked ones) found in different parts of the province, may be classed as palæoliths, they have, up to the present time always been found associated in such a way with neoliths that it is impossible to designate them as po'æoliths with any degree of certainty. Leaf-shaped "flints" have been picked up that are quite as rudely formed as any from the deepest stalagmite deposits of Europe, but never in situations to suggest that they are other than rough-hewn tools or weapons, which, as such had a purpose in the economy of people who are capable of producing better things. Until we find specimens of this kind, as Dr. Abbot found them in the Trenton gravels, or in some situations isolated from all others, or distinct as to material or coating from specimens of a superior quality in the same neighbourhood, we shall not be warranted in making any distinction relative to time of possible production." It is gratifying to hear of would-be palæoliths being found even in Eastern Canada alongside with neoliths, for this coincidence appears to me a confirmation of the opinion that, in America at least, these divergences of type are suggestive less of distinct epochs than of unequal skill in the craftsmen, or possibly ethnic difference in the race, that produced them. I am persuaded that had Sir. A. Mackenzie examined with the care of an antiquarian the arms of the Western Dénés whom he met one hundred years ago, he would have found both styles co-existing among them.

Apart from the above missile and cutting arms, the Carriers and Babines possessed two other offensive weapons of stone, which they called respectively, R*əl* and *thəl'tə*R.

The first is the war club of which at least two different types existed.

Fig. 41.

Fig. 40 is a club of a grayish basaltic rock which has been treated to a partial polish only, as its surface is naturally smooth. A variety of the same was of bone, or more generally of cariboo horn. Its shape and use were identical, but its length was about double that of the stone weapon. Fig. 41 represents a club of a different and perhaps more common pattern. It is of carefully pecked granite, and though the specimen illustrated is imperfect, the base and knob being wanting, I have had no difficulty in reconstituting it to its original form after other similar weapons I have seen in several parts of our district. To the knob at the small end was fastened a buckskin line which, being firmly wound around the wrist and hand of the warrior, ensured the safe keeping of the weapon amidst the excitement of the fray.

The skull-crackers, vulgarly called "tommy-sticks," of the plain Indians of the North-West Territories, are well-known even to others than archæologists. I have never suspected their presence among the ancestors of our present Déné population west of the Rockies until last year, when the example (fig. 42) was found in Hwotsu'tin territory. It came as a revelation upon the Carriers, none of whom was found who could do more than guess its use. It is somewhat peculiar in appearance, and its groove is but rudely and irregularly formed.

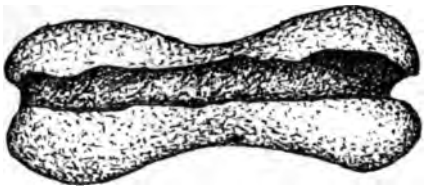


Fig. 42. ⅓ size.

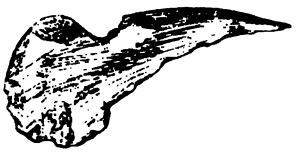


Fig. 43. ½ size.

The innocent-looking little piece of partly polished stone designed in fig. 43 was, in the hands of a Babine Indian, a rather treacherous weapon. It is the temple-lancet or skull-cracker * referred to above. After it had been securely hafted to a wooden handle three or four feet

* *Thəl'tə*R.

long, stone lancet and handle forming, when connected, a scythe-like implement, the warrior—or indeed assassin, as the case may have been—struck therewith his victim on the temple, oftentimes thus causing instant death.

Before bringing to a close this chapter devoted to stone implements, it may not be amiss to say a word concerning the art of stone chipping as practised by the prehistoric Dénés. I remember having read in a publication emanating from a learned society, an elaborate dissertation on this subject wherein the author took great pains to elucidate difficulties which to me appeared to be mainly of his own making. It may be that the rules of the craft varied with the localities and the material employed; but here, among the Western Dénés, there was no great mystery about the operation.

The material chosen in preference to fashion arrow or spear heads with was loose, broken pieces of the rock such as were found on the surface. Of course these were confined to a few localities only, wherein were situated sorts of quarries which were very jealously guarded against any person, even of the same tribe, whose right to a share in their contents was not fully established. A violation of this traditional law was often considered a *casus belli* between the co-clansmen of the trespasser and those of the proprietors of the quarry.

The first operation consisted in roughly blocking off with a hard stone the pieces of the flint, the removal of which was necessary to obtain a vague resemblance to the intended weapon. Then grasping the flint lengthwise with the closed fingers of the left hand (fig. 44), the arrow-smith carefully pressed off the flakes with an elongated stone held in his right hand, until the desired form and finish were obtained. A piece of buckskin served as a pad to protect the hand against the asperities of the point.

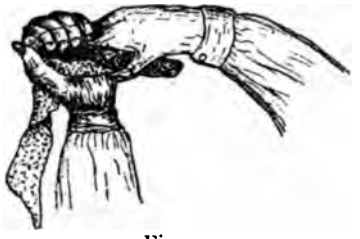


Fig. 44.

I owe these details to an old chief who has been an eye-witness to the operation. I should add that in not a few cases a moose molar tooth replaced the long chipping stone. I know also of a very few points the sharp edges of which have been polished off by friction.

CHAPTER IV.

BONE AND HORN IMPLEMENTS.

Several bone or horn objects formerly in use among the Western Dénés have already been mentioned in connection with stone implements of congenerous nature. As they were mostly weapons or working tools which have long been replaced by iron or steel substitutes, few of them could be illustrated from existing specimens. Such as will be found described in the present chapter are, however, still largely used by the natives, even of the Carrier tribe.

Fig. 45.

They are, with few exceptions, industrial implements. Among those which serve in connection with hunting or trapping, one of the most conspicuous is the *tsa-yu-thej* (beaver-medicine-recipient, or castoreum bottle). As will be seen further on, this same vessel is of birch bark among the Carriers. But the Tsé'kéhne, who are essentially huntsmen and whose country abounds in large game, make it out of a cariboo horn, and adorn (?) it with such primitive designs as may be noticed in fig. 45. Therein the trapper keeps the castoreum which he dilutes either on the steel trap, or in the mud contiguous thereto, in order to decoy the beaver into its ultimate capture.

Of course this mode of trapping is practicable only during the spring or summer months. In the winter, beaver is sought after with nets set in holes cut in the ice a short distance from the rodent's habitation and store. I have elsewhere given an account of this winter trapping which will, perhaps, bear reproduction here. "Once they have found his [the beaver's] lodge, an indispensable preliminary to secure his capture is to discover the exact location of his path or trail under ice. It appears that he follows well marked routes when swimming from, or returning to his winter quarters. These our Dénés easily find out by sounding the ice in different directions with cariboo horns. Their well exercised ears readily discover by a peculiar resonance of the ice where the rodent's usual path lies. So, at a given point, they cut a hole wherein they set their babiche beaver net,"* taking care to plant at a short distance a

* "The Western Dénés," etc., Proc. Can. Inst. vol. vii., p. 131.

stick the upper end of which is provided with little bells—the counterpart of the beaver nails and pebbles which did duty in prehistoric years. To this upright stick the side ropes of the net are attached in such a way as to be ready for use when the game is to be ensnared. "Then the hunter (should I not say fisher?) proceeds to demolish the beaver's lodge, in order to drive him off. Should the game not be found there the same operation is repeated at his adjoining provision store. When the undulations of the water tell of his presence therein, he is frightened away to where the net is set. Supposing that the beaver is swifter than his hunter and reaches the net before the latter, the efforts he will make to extricate himself therefrom will agitate the small bells before mentioned, and the hunter will immediately make for the hole and draw him out before he has time to cut himself clear of the net."*

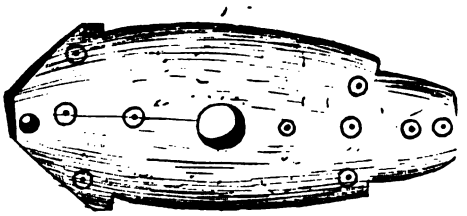


Fig. 46.

Fig. 46 represents the *mas*, a bone device indispensable to the efficiency of the beaver net. It is attached to the end of the net which is laid out at the opening in the ice wherein it floats on the water. The side strings of the net are passed through the centre hole of the bone piece (mas) and thence connected with the little bells at the top of the outstanding stick, so that by pulling them up, the farthest end of the net, which is under ice, will be drawn back to where the mas is secured, and thereby the game will be bagged, as it were, and speedily killed on the ice. These bone pieces affect divers forms, several of which are symbolical. Thus the mas shown above, is intended to represent a beaver. It will be remarked that the design is highly conventionalized. Yet, even a child (of Déné parentage, of course) will recognize at once its significance.

Barbed harpoons† such as those shown in the accompanying figures are resorted to when the Déné is out beaver hunting—not trapping or snaring,—that is in such cases as when the beaver is met with free of any trap or net. Until a short time ago those beaver harpoons were made of cariboo horn; but to-day implements of identical shape wrought out of steel files or pieces of iron have almost entirely superseded the

* *Ibid*, p. 132.

† *ʒta-t'sɔn*, "lip or barb-bone."

original horn weapon. To-day, as formerly, they are securely fastened to a handle three or four feet long, wherewith they are launched at the

Fig. 47. ½ size.

game much as would be done with a regular lance. The shaft is intended to secure greater impetus and efficiency to the weapon. The specimen illustrated by fig. 47 is a find, and is therefore more ancient

Fig. 48. ½ size.

than that shown in fig. 48 which is quite modern. A comparison between these implements and those of similar intent in use among widely different races of Indians all over North America cannot fail to elicit the remark that the same needs create the same means. *

In the act of dressing hides several bone or horn implements are still used among the Western Dénés. These are the fat-scraper, the hair-scraper, the bone-awl, and the skin-scraper.

Fig 49.

The first† is made of a split cariboo horn (fig. 49) and, as its name indicates, it serves to scrape off the fat adhering to the fresh skin. This fat is received in the concave part of the implement and thence transferred to a bark vessel close by. In the form above delineated, it is more of a Tsé'kéhne than of a Carrier tool, and as such it does service more particularly in the treatment of marmot (*Arctomys monax* and *caligatus*) and wild goat (*Aplocerus montanus*) skins.

The Carrier equivalent therefor generally consists of the socket end of the shoulder blade of the cariboo, left almost in its natural state.

---

* *See* Ann. Rep. Canad. Inst. 1888, p. 58, figs. 100, 101.

† *Pe-tha-ɔtzo*, "wherewith the flesh-side is scraped" (of a liquid or fat substance): fourth category of nouns.

This implement is used in connection with grease or fat scraping of any description.

Fig. 50. ½ size.

Once the hide has been freed of most of its fat and blood, it is soaked in cold, and then in warm, water, after which one of its extremities is lashed up around the smaller end of a stout pole leaning on any kind of support, a wall, a fence, etc. The hair is then removed by energetic action on the skin hanging down over the pole with a scraper* formed of the tibia of a cariboo (fig. 50). By reason of the peculiar tenacity of the hair, moose skins are now operated on with a short curved steel knife. But the bone instrument shown above is still very extensively employed in connection with any other kind of hair scraping.

After having been thoroughly rubbed with the brain of the animal, its skin is next extended within a wooden frame as is practised by most tribes of Aborigines. The holes near the edges through which the line

Fig. 51.

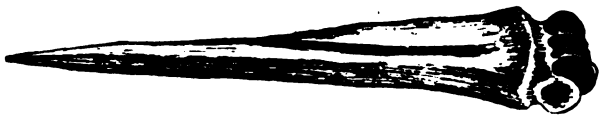


Fig. 52.

which fastens it to the frame is passed, were formerly and are still in some localities, pierced with bone awls† identical in form and material with those occasionally found in mounds. They are of the fibula bone of the cariboo, or, as in fig. 52, of the black bear. The latter are more common among the Tsi|Koh'tin. In times past such awls were resorted to whenever any skin or bark perforations, such as are incident to the art of canoe building or sewing bark vessels, were found necessary. They are now obsolete, steel having almost entirely replaced bone in the fabrication of any such tools. Yet the specimens illustrated above were in use among the Carriers and the TsilKoh'tin immediately prior to their being given me.

---

* *Pe-na-ɔlqé*, "wherewith one scrapes off" (*i.e.*, hair); fourth category.

† *ʒkwɔt-tsɔl*, "knee-bone awl"; third category.

The object in view while spreading the skin in its wooden frame is to remove its "mack" or inner cuticle. This is accomplished by means of bone scrapers,* which are everywhere essentially the same, but whose form or even material varies according to the tribe by which they are used.

Fig. 53. ⅓ size.

Thus the Tsiʅkoh'tin scraper (Fig. 53) is of bear bone and wedge-like in form. The skin wrapping shown in the cut is quite often wanting.

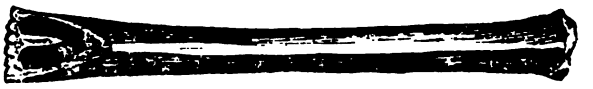


Fig. 54. ½ size.

The Carrier scraper (Fig. 54) is of cariboo bone and shaped somewhat like a chisel. Its main peculiarity consists in the teeth cut in its edge to prevent its slipping too easily over the skin and ensure better gripping power. Identical implements are at times found as relics of extinct races in many parts of the northern American continent, and I still remember how the perplexity as to their probable destination evidenced through the lines of an antiquarian, who some years ago was describing one of them, brought home to me the advantages enjoyed, even from an archæological standpoint, by persons actually passing their life among the aborigines.

Fig. 55. ½ size.

Among the Tsé'kéhne the skin scrapers are of cariboo horn, thinned and reduced to the form of that delineated in fig. 55. A piece of buckskin wrapped around the end held in the hand facilitates the handling of that rather awkward implement. The serrated edge of the Carrier scraper is also reproduced by the Tsé'kéhne. Or indeed it is quite as likely that the Carriers have learned this peculiarity from the Tsé'kéhne, who in their turn have borrowed it from the Crees and other Algonquian

* *ʒtha-nkwot*, "it scrapes (by pecking) the flesh side."

tribes of the East, all of which observe it in making their skins crapers, while the Tsi|Koh'tin, who are the most distantly situated from them, seem to be ignorant of it.

All of these scrapers also do service in the process of skinning animals as means of separating the hide from the flesh.

If we now pass from bone implements connected with hunting to such as are laid under contribution as means of furthering the fishing industry, we may note in the first place the *ta-krét* * or fish harpoon (fig.

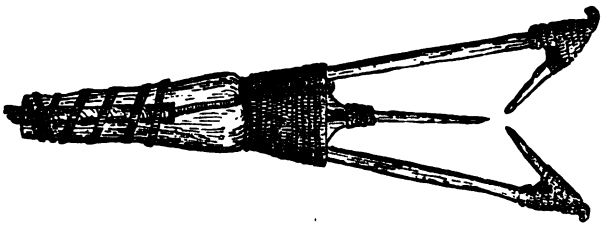


Fig. 56. ⅛ size.

56). The cut renders a detailed description of it unnecessary. The only wooden parts are the shaft and the socket, round which is wound the skin line which fastens the two side-hooks of the harpoon, while it secures in its proper place the middle prong. The hook pieces are fastened with sinew. An archæologist fond of comparisons cannot fail to notice the resemblance of this weapon to its Eskimo equivalent such as illustrated in fig. 453 of Dr. F. Boas' "The Central Eskimo." † The ta-krét serves to dart a large species of white-fleshed salmon (*Oncorrynchus chouicha*, Walbaum), called *kes* by the Carriers and *qes* by the Tsi|Koh'tin. Nowadays these implements are mostly of iron or steel; but their shape has remained unaltered.

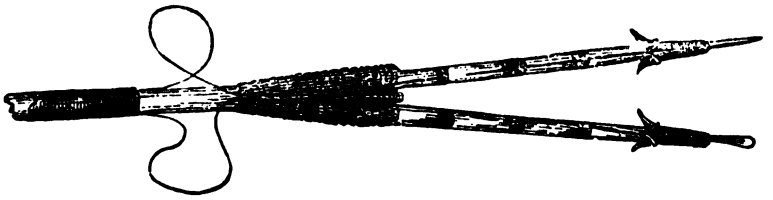


Fig. 57. ¼ size.

The Tsi|Koh'tin spear salmon with a harpoon of a totally different pattern (fig. 57). It is double darted, and so made that upon fastening in the flesh of the fish, both darts detach themselves from the forked shaft to

* "Lip-dart," by allusion to its mouth-like appearance.

† Sixth Ann. Rep. Bureau of Ethnology, 1884-85.

which they are secured by means of a plated raw-hide line. The whole detachable points of this implement were originally of mountain sheep horn; but in modern specimens the tip is generally of iron and occasionally of copper, the barbs only being of horn.

Both the Carrier and the Tsi|Koh'tin harpoons are hafted to shafts sometimes as much as 12 or 15 feet long, so as to render them serviceable from the top of rocks or precipitous river banks emerging from the rapids where that species of fish is wont to congregate.

Implements of that size are designed exclusively for salmon fishing. For smaller fish, besides the nets, which will be described in their proper place, the Carriers have recourse to a bone or steel harpoon of analogous model with that of fig. 56, but reduced in dimensions and hafted to a short handle. If in the winter time, bait is used as a means of attracting the fish. Having cut in the ice a hole of sufficient diameter to observe the movements of the trout underneath, the Carrier drops and gently

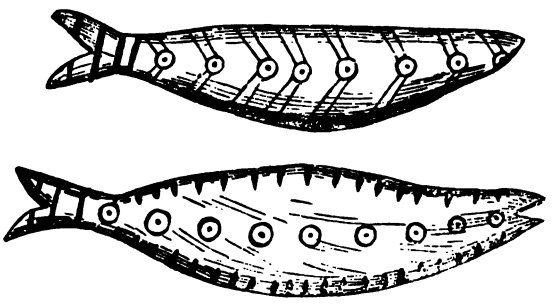


Fig. 58.

oscillates in the water bone imitations of Coregone fry (fig. 58), hanging through a sinew line from a wood or bone piece held in the left hand. Upon biting the bait, the fish is speedily speared with the above mentioned harpoon.

Here (fig. 59) we have a fishing implement which, though of a rather primitive style, yet requires but little explanation. The lancet or pin-like part of the hook* only is of bone, while the shank is of wood. This implement is drawn natural size. In remote localities, during hunting expeditions away in the woods, it is found to this day very serviceable.

A fishing device less modern in appearance is shown in fig. 60. It is called by the Carriers *thé-sateñ* a word which cannot be better translated than by "lying on the bottom," though the actual equivalent of that phrase would be *thé*R-*ɔsthan*. A very small fish is used as bait and fastened in

* *Qɔs*; prim. root.

this wise to the implement; the whole of the bone pin including the sinew line to which it is attached is passed through the anal part of the fish

Fig. 59.

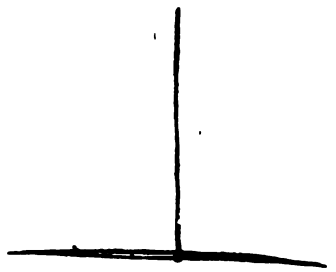


Fig. 60.

and then one-half of it is inserted lengthwise through the body of the fish commencing from the point of initial insertion of the sinew line to the head, after which the whole is dropped in the water and held as in the case of the bone coregone bait. The larger fish, generally the loche or turbot (*Lota maculosa*) which is very voracious, overlooks the other half of the implement left bare, and by gulping down the small fish gives warning to the fisherman, who instantly pulls up the whole, thereby sinking the bone pin in the gills of the large fish which is thus easily secured.

As a rule, the small end bones of the loon's wings, or occasionally even young beaver ribs, are the material chosen to make the two last mentioned implements. The same probably served also to fabricate the needles of the prehistoric Dénés. But none of them is now extant, and this may be a mere conjecture.

Before proceeding further, a word about the species of fishes more extensively sought after by the Carriers and the Tsi|Koh'tin may not be out of place. They are of course very numerous, but king among them all is the salmon, and of the five species which are now known to ascend their rivers, the suck-eye (*Oncorhynchus nerka*, Walbaum) or *tha-llo* * is by far the most important either on account of its economic value or of the prodigious numbers of its annual run. Next in abundance and

* "Water-fish."

importance as an article of diet is the large white flesh salmon or *kes* which has already been mentioned. These two species are common to most of the streams within Carrier, Babine and Tsi|Koh'tin territory, though the latter avoids not a few minor tributaries of the large rivers. One is particular to Babine lake and outlet—it is the hump-back salmon* (*O. gorbuscha*, Walb.) It is not of much value. The two other species, *thestlé*† and *ta-tzəR*‡ in Carrier are quite plentiful in such streams as discharge their waters through the Skeena river; but according to local observations they make their appearance in Stuart's Lake and immediate outlet only when the next run of the tha-llo is to be extraordinarily large. As far as I can judge the *thestlé* is the *O. keta* of Walbaum, such as described by Jordan and Gilbert;§ but I can find no specific name for the ta-tzəR, whose native name is an exact translation of the scientific word for all the Pacific Salmons: ὄγκος, hook; ῥυγχος, snout; Carrier: *ta*, snout (and lip); *tzəR*, hook.

To the above should be added the *késəl*‖ or land-locked salmon (*O. Kennerlyi*), which is much appreciated by the native palate and captured mainly with the help of fish traps or *'kuntzai*. It is however inferior in point of economic importance to the great lake trout (*Salvelinus namaycush*, Walb.) called *pît* by the Indians and which is extensively sought after either during the autumn months or the cold season. In the former case it is quite frequently dried and cured as the red salmon or thal o. The other trouts to be found in Déné lakes or rivers are the common trout (*Salmo purpuratus*, Pallas) and the bull trout (*Salvelinus malma*, Walb.) There are also two species of whitefish, the *Coregonus clupeiformis* (Mitch.) and the *Coregonus quadrilateralis* of Richardson, which in some localities are caught in such large quantities that many thousands are usually kept frozen for use during the winter.

The above are, of course, the best fish available here. But as the child of the forest has not always the choice of his diet, he must more often than once content himself with such carps or carpiodes, such suckers or catastomidæ as may chance to venture too near his drag-net. These seldom fail him. Their name is legion, and I will not be so rash as to attempt a nomenclature of them.

---

* *Stam'oñ*, a word which to a Déné ear appears quite foreign.

† A noun of the second category.

‡ "Lip (and snout)-hook."

§ Synopsis of the Fishes of North America by D. S. Jordan and Ch. H. Gilbert, Washington, 1882.

‖ Almost equivalent to "small *kes*" or white flesh salmon.

I did not mention the sturgeon (*Accipenser transmontanus*, Richardson), because, although it is a welcome visitor to our lakes, its visits are too rare and far between to entitle it to serious consideration in this connection. It is caught in large meshed nets.*

To join the two extremes, I will add to the sturgeon, the largest of our fresh water fishes, the *théɿmək*,† a very small fish which I think is not known to Ichthyology. It frequents a few little lakes only, and is taken with scoop-nets during the few mild days which usually interrupt the severity of our winters. The quantity of that fish brought home after one single afternoon's absence from the village is sometimes really enormous.

To be complete I should have noticed among bone implements serving fishing or trapping purposes, the *əté*,‡ or ice-breaker. This is, however, a mere pointed cariboo horn, which tends to disappear as a working tool, being gradually replaced by a piece of iron or steel, whenever this can be obtained.

There is a horn wedge which, even at the present day, serves to split the slender rods of which are made the *'kuntzai* or fish baskets, which shall be described in the chapter devoted to wood implements. As in most implements requiring hard material, cariboo horn is chosen to make these wedges.

Fig. 62. ¼ size.

The above figure requires no explanation. A glance at the horn ladle

* The Carrier name of the sturgeon is *ɿe-tco*, "big-fish."

† A root of the second category, the first syllable of which refers to the lake bottoms from which these fishes seem to suddenly emerge.

‡ *ʒté* means "horn," and is used to designate even steel ice-breakers. The ancient name for them is *tzoñtziɿ* in Carrier which is evidently identical with the present *tzoroñtziɿ* of the Tsiɿkoh'tin.

and spoon therein represented will show that our Western Dénés' handiwork is of a very poor grade indeed compared with that of the elaborately carved Haida, Tsimsian or Tlingit spoons. The only attempt at

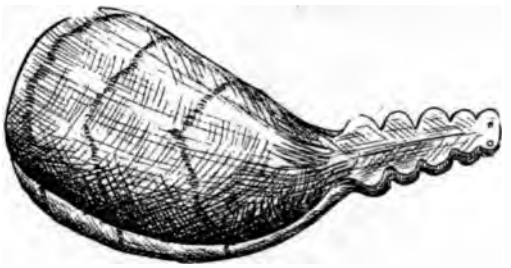


Fig. 63. ¼ size.

design or ornamentation of any kind appears in the Tsé'kéhne spoon or ladle (fig. 63). Genuine Carrier utensils of this class, which are either of wood or of horn, are even plainer than those above illustrated. Evidently our Dénés have no eye for the beautiful. In all cases of horn spoons the material is mountain sheep horn.

The manufacture of such household implements necessitates the possession of no extraordinary amount of skill. After the horn has been split in two equal halves, a spherical, smooth-surfaced stone is heated, and to expand the too contracted sides of the horn they are applied thereon and gently pressed out, a layer of pitch having previously been spread over the stone so as to give consistency to the material of the spoon and prevent its artificially distended parts from returning, when cooled, to their original shape. The finishing touches are then given with the carving knife.

Keeping within the same class of industrial bone implements, we come on the bark peelers * and the cambium scrapers.† Both of these are in great demand every recurring spring for the purpose of extracting for food the cambium layer of the shrub pine (*Pinus contorta*). Their name sufficiently describes their use. Below is the Carrier type of both peeler and scraper, which, it should be remarked, are oftentimes much larger than those after which fig. 64 has been drawn. In fig. 65 we have a double-edged scraper, which, though known among and sometimes used by the Carriers, is more frequently seen among the Tsé'kéhne. The various styles of these useful implements are all of cariboo horn. The

* *Enit'qəl*, "it penetrates by tearing," a verbal noun.

† *Eltzo*, "that which scrapes," verb. noun.

shavings-like cambium thereby obtained is much relished by the natives,

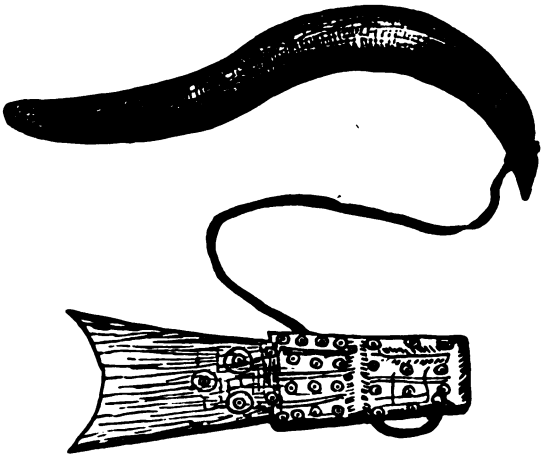


Fig. 64. ½ size.

who even collect it at times for the purpose of drying and keeping for use during the winter months.

Fig. 65. ½ size.

If from the indispensable or useful we pass to the agreeable, the gambling sticks formerly used among our aborigines may claim our attention. Here, again, we find the elegantly-carved gambling sticks of the West Coast tribes replaced by simple polished pieces of lynx or other animal's bones without any particular design, and with the mere addition to one of the pair of the sinew wrapping necessary to determine the winning stick. The Babine specimens (fig. 66) are rather large and must prove awkward in the hand of the gambler. But they have the reputation of being preventive of dishonesty, if distinctions between the honest and the dishonest can be established in connection with such a pastime as gambling. Such of these trinkets as are hollow have generally both ends shut with a piece of wood, and contain minute pebbles and gravel which produce a gentle rattling sound in the hand of the native, much to his own satisfaction.

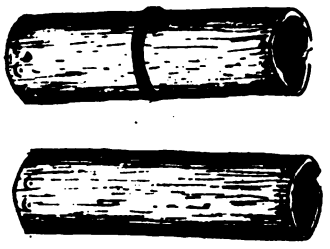


Fig. 66. ½ size.

Fig. 67 represents the Tsi|Koh'tin and fig. 68 the Tsé'kéhne equivalent of the Babine gambling sticks. It will be seen from the latter that the Tsé'kéhne, who are the most primitive and uncultured of the three tribes whose technology is under review, are again the only people who in this connection, as with regard to their spoons, have made the merest attempt at bone carving.

Fig. 67.

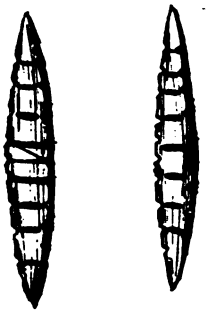


Fig. 68. ½ size.

The game played with these bone pieces is, I think, too well known to demand a description. The jerking movements and passes of hands of the party operating therewith, as well as the drum beating and the singing of the spectators or partners, are practised among most of the Indian races, especially of the Pacific Coast, which have occupied the attention of American ethnologists. The Abbé Petitot says in one of his latest publications* that this game is adventitious among the Eastern Dénés who have borrowed it from the Crees. This remark is no less apposite with regard to their kinsmen west of the Rocky Mountains. Although no other chance game possesses to-day so many charms for the frivolous Western Dénés, the old men assure me that it was formerly unknown among their fellow countrymen. That their testimony is based on fact, the very name of that game would seem to indicate, since it is a mere verb in the impersonal mood: *nət'sə·a*, "one keeps in the hand while moving," and is therefore of the fourth category of Déné nouns. The word for "gambling sticks," such as used in connection with nət'sə·a, is *nə'ta*, which is the same verb under the potential form and means "that which can be held in the hand." Any of the surrounding races, Tsimpsian, Salishan or Algonquin, may be held responsible for its introduction among the Western Dénés, for they are all exceedingly fond of it.

The original counterpart of the modern nət'sə·a was the *atlih*,† which

*I think it is in his book *En route pour la Mer Glaciale, Paris*, 1888.

† May be translated by "Gambling" in a general sense.

in times past was passionately played by the Carriers, but is now altogether forgotten except by a few elder men. It necessitated the use of a quantity of finely-polished bonesticks, perhaps four or five inches long, of which a correct idea may be gathered from fig. 336, illustrating Niblack's "The Indians of Southern Alaska."* These bones were called *altɛ́*, a root word of the second category, implying much greater antiquity than that of the nə'ta

Speaking of atlih, a tradition which has some bearing thereon comes up for a share in the reader's consideration. If of no interest to the archæologist, it will serve a sociological purpose and may have the advantage of furnishing us with a *peinture de mœurs*, as the French have it. Here it is.†

"A young man was so fond of playing atlih that, after he had lost every part of his wearing apparel, he went so far as to gamble away his very wife and children. Disgusted at his conduct, his fellow villagers turned away from him and migrated to another spot of the forest, taking along all their belongings, and carefully extinguishing the fire of every lodge so that he might perish.

"Now this happened in winter time. Reduced to this sad fate, and in a state of complete nakedness, the young man searched every fireplace in the hope of finding some bits of burning cinders, but to no purpose. He then took the dry grass on which his fellow villagers had been resting every night and roughly weaved it into some sort of a garment to cover his nakedness.

"Yet without fire or food he could not live. So he went off in despair without snow-shoes, expecting death in the midst of his wanderings.

"After journeying some time, as he was half frozen and dying of hunger, he suddenly caught sight in the top of the tall spruces of a glimmer as that of a far-off fire. Groping his way thither, he soon perceived sparks flying out of two columns of smoke, and cautiously approaching he came upon a large lodge covered with branches of conifers. He peeped through a chink and saw nobody but an old man sitting by one of two large fires burning in the lodge.

"Immediately the old man cried out: 'Come in, my son-in-law!' The young man was much astonished, inasmuch as he could see nobody outside but himself. 'Come in, my son-in-law; what are you doing out

* Rep. U. S. Museum, 1888, plate lxiii.

† It must be remarked that in the version the most in vogue among the Carriers, the beginning of this legend is very different from that adopted here after Julian *ɣtetsá-niya* (he walks ahead) of this place, Stuart's Lake.

in the cold?' came again from the lodge. Whereupon the gambler ascertained that it was himself who was thus addressed. Therefore he timidly entered, and, following his host's suggestion, he set to warm himself by one of the fires.

"The old man was called *Nə-yəR-hwolluz* * because, being no other than Yihta,† he nightly carries his house about in the course of his travellings. 'You seem very miserable, my son-in-law; take this up,' he said to his guest while putting mantlewise on the young man's shoulders a robe of sewn marmot skins. He next handed him a pair of tanned skin mocassins and ornamented leggings of the same material. He then called out: 'My daughter, roast by the fireside something to eat for your husband—he must be hungry.' Hearing which, the gambler, who had thought himself alone with Nə-yəR-hwolluz, was much surprised to see a beautiful virgin‡ emerge from one of the corner provision and goods stores§ and proceed to prepare a repast for him.

"Meanwhile, the old man was digging a hole in the ashes, whence he brought out a whole black bear cooked under the fire with skin and hair on. Pressing with his fingers the brim of the hole made by the arrow, he took the bear up to his guest's lips, saying: 'Suck out the grease, my son-in-law.' The latter was so exhausted by fatigue that he could drink but a little of the warm liquid, which caused his host to exclaim: 'How small-bellied my son-in-law is!' Then the old man went to the second fireplace, likewise dug out therefrom a whole bear and made his guest drink in the same way with the same result accompanied by a similar remark.

"After they had eaten, NəyəRhwolluz showed the gambler to his resting place and cautioned him not to go out during the night. As for himself, he was soon noticed to leave the lodge that and every other night; and, as he came back in the morning, he invariably seemed to be quite heated and looked as one who has travelled a very great distance.

"The gambler lived there happily with his new wife for some months. But his former passion soon revived. As spring came back, he would take some alté in an absent-minded way and set out to play therewith all alone. Which seeing, his father-in-law said to him: 'If you feel

---

* Lit. "he-carries (as with a sleigh)-a-house." The final *hwolluz* is proper to the dialect of the Lower Carriers, though the tale is narrated by an Upper Carrier, which circumstance would seem to indicate that the legend is not, as so many others, borrowed from a Tsimpsian tribe.

† *Ursa major.*

‡ *Sak-əsta*, "She sits apart."

§ See the Chapter on the Déné habitations.

lonesome here, my son-in-law, return for a while to your own folks and gamble with them.' Then handing him a set of alté and four *tətquh*,* he added: 'When you have won all that is worth winning, throw your tətquh up over the roof of the house, and come back immediately. Also remember not to speak to your former wife.'

"The gambler then made his departure, and was soon again among the people who had abandoned him. He was now a handsome and well-dressed young man, and soon finding partners for his game he stripped them of all their belongings, after which he threw his tətquh over the roof of the lodge. He also met his former wife as she was coming from drawing water, and, though she entreated him to take her back to wife again, he hardened his heart and did not know her.†

"Yet, instead of returning immediately after he had thrown his tətquh over the roof, as he had been directed to do, his passion for atlih betrayed him into playing again, when he lost all he had won. He was thus reduced to his first state of wretched nakedness. He then thought of NəyəRhwolluz, of his new wife and his new home, and attempted to return to them, but he could never find them."

Fig. 69. ¼ size.

A third chance game was proper to the women and was played with button-like pieces of bone. It was based on the same principle as dice, and, in common with atlih, it has long fallen into disuse. Its name is *atiyéh*.

The three bone implements which remain to be described have likewise disappeared from among the Carriers to whom they were proper. Thus fig. 69 shows a *télni* or ceremonial whistle, which could not at present be identified by one-twentieth of the living Carrier population. It is made of the larger wing bone of the swan, notched near, and slit at, one end exactly as shown in the above figure and without the insertion of any mouth-piece. On great ceremonial occasions, the notable or native nobleman, who was privileged to accompany his dance therewith, kept it constantly in his mouth unsupported by the hand, and from time to time extracted therefrom loud, shrill notes, which added not a little to the liveliness of the scene.

The object represented by fig. 70 differs but little from the preceding, the material being identical and the form almost so. But its use and destination are widely different. It is a *t'sən-'kuz* or "bone-tube"

* A long throwing rod which serves to play another game. It will be figured and explained further on.

† In the biblical sense of *Cognovit*.

through which Carrier and Babine girls attaining the age of puberty had to drink under pain, it was said, of contracting dreadful throat diseases should they attempt to quench their thirst by helping themselves im-

Fig. 70. ½ size.

mediately from the water vessel as was done by common folks. This trinket was constantly carried about, hanging from the sinew and down necklace usually encircling the neck of such pubescent maidens, also as a specific against malign influences.

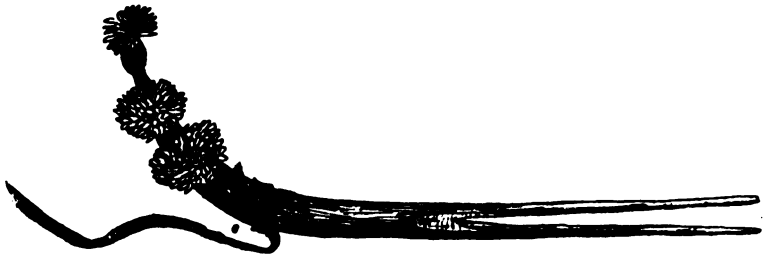


Fig. 71. ½ size.

Closely connected therewith was the double-pronged comb shown in fig. 71. It was worn in the hair and likewise connected with the medicinal (?) necklace through a long, loosely-hanging string adorned with beads, or, in primordial times, dentalium shells or other small articles of native ornament. Its use was not restricted to pubescent girls, but this comb or *tsi-ltsɔt*,* as it was called, was also common to young men attaining maturity. It should perhaps be remarked that in this latter case the instrument was of wood, not of bone. "Comb" is rather a misnomer when applied to such an object which served merely to scratch one's head with, as immediate contact between the fingers and the head was then reputed productive of fatal diseases.

Apropos of diseases it may be mentioned that bleeding as a surgical operation was, and still is, frequently resorted to by our Western Dénés. So far as my information goes, there was in pristine times no surgical instrument such as an equivalent of our lancet employed in this con-

* "Head-scratches," verb. noun.

nection. It would seem that the operation was formerly performed either with a bone needle or awl, or more commonly with a sharp-edged stone arrow head.

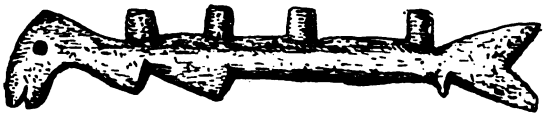


Fig. 72.

Fig. 72 illustrates the change brought in the native huntsman's economy by modern civilization. It is a little piece of bone carved to the shape of a fantastic being, half animal (viz. coyote), half fish, on the back of which little excrescences have been left, the object of which is to hold as many metallic caps for use with a shot gun. This little trinket is fastened to the string of the powder-horn or to that of the shot pouch. It is more commonly cut out of a piece of thick leather without any attempt at design.

CHAPTER V.

TRAPS AND SNARES.

FISH TRAPS.

Judged by their staple food, the Carriers and the Tsi|Koh'tin are maritime or coast tribes, since they mostly rely upon the annual run of salmon for their sustenance during the whole year. But, owing to the topography of their country and their peculiar environments, their mode of securing their supply of the fish materially differs from that adopted by the coast Indians. Nay more, even among themselves the process varies according to the localities and the nature of the fish stream. It may be broadly stated that at least seven different devices are resorted to, which I shall presently endeavour to explain.

In the first place one should not forget that the salmon almost exclusively referred to in the present paragraph, that on which the two tribes named above mainly subsist, is the so-called Fraser River salmon (*Oncorhynchus nerka*, Walbaum). It is exceedingly gregarious in habits and usually plentiful. As will soon be seen, these two peculiarities are taken occasion of by the natives to facilitate its capture.

Where it is practicable the Kamstkadals' method of salmon-fishing is followed. This consists in staking across the river in its whole width and leaving for the fish only narrow passages ending in long, funnel-shaped baskets from which escape is impossible. Owing to the importance of this industry, some detailed explanation of the whole process will not be out of place.

At intervals of forty or fifty feet heavy posts are driven as solidly as possible in the bed of the stream from shore to shore, and on these will depend the strength of the whole structure. As an additional guarantee against the action of the current, as many props or braces are sunk slanting down stream and secured against the upright posts close to the water line. In this and all similar cases the fastening material consists of willow, high cranberry bush or spruce sapling wattle. Finally, heavy poles, as long as can be found, are laid transversely on the forks formed by the intersection of the piles with their props, and the result constitutes what may be called the skeleton of the weir. The intervals between the upright posts are afterwards filled in by poles driven down in the bed of the river, and as these are placed on the upstream side of the

long railing already mentioned, no artificial fastening therewith is required. The weir is then ready to receive the fishing apparatus, which consists of the hurdles,* the bottle-like baskets *nazrwət*† and the narrow terminal baskets, Kəs.‡

The hurdles are made of different sizes, according to the place they are to occupy. They are simply barkless spruce switches, held slightly apart by a few transversal sticks laid against, not entwined with, the trellis work, and there secured by being wattled with wattup or spruce root. The larger number of these hurdles serve to line the upstream side of the weir, thereby closing every possible issue through it, while with the rest are constructed corral-like enclosures guarding the mouth of the baskets, as shown in the accompanying diagram (fig. 73). The

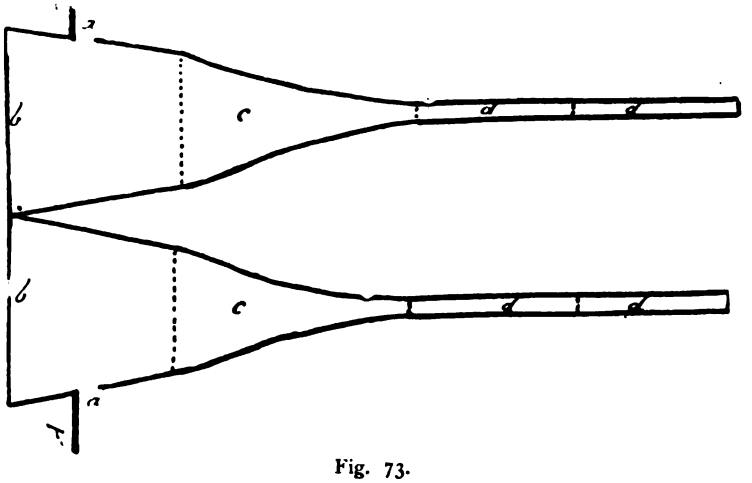


Fig. 73.

entrance to these corrals, and therefore to the trap, is at *a*, and is generally half a foot wide. *A* stand for parts of the barrier or weir. The salmon upon stealing in finds its way up blocked at *b*, and by a sidewise evolution comes in sight of the long conduit prepared for it in the shape of the nazrwət or main basket *c*, together with the narrow terminal cylinders *d*. With a view of liberating itself from the hurdle enclosure, it swims down as far as the terminal cylinders, which, being too narrow to permit of its turning back, thus determine its capture. Others following will soon pack even the broader end of the nazrwət to such an extent that oftentimes no moving room is left. The dotted outlines in

* *ʔcə-stʃu*, a contraction of *tcən-stʃu*, "stick-twined."

† A contraction of *nanɬzrwət*, "cylindrical at the mouth (and long in body)."

‡ Prim. root. Means any long, slender and smooth-surfaced appendage, as a handle, a stem. So named because it is considered as the handle of the funnel-like basket or *nazrwət*.

the above diagram represent the end of each basket which, it is useless to add, is left opened so as to afford a free passage for the fish. Such traps are generally constructed in pairs as is shown above.

Instead of shutting with trellis work the furthest end of the last Kəs or narrow cylinder, some add thereto a large rectangular box-like reservoir provided with a conical conduit or entrance (fig. 74) tapering into the box so as to preclude the possibility of the fish escaping once it has entered and found the liberty of movements it lacked while in the narrow baskets. Therein the salmon crowd in such numbers that they soon get packed as sardines in a box and finally squeeze themselves to death.*

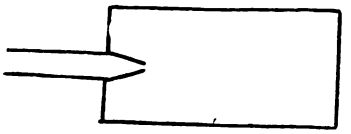


Fig. 74.

This trap is efficient at night only, and when the large terminal basket just mentioned is wanting, the nazrwət has to be watched lest the fish remaining at its mouth eventually make good their escape. At least two Indians go every morning and lift up with wooden hooks (fig. 75) such parts of the trap as cannot easily be reached by the hand and carefully empty its contents into their canoe. The Kəs are but temporarily connected, being detachable at will Two or three, or in extreme cases as many as four, are ordinarily added to the nazrwət.

Fig. 75.

The nazrwət measures at least 15 feet in length and as much as 6 or 8 feet in its greatest width,† while its narrow end is not more than 6 inches wide. Uniform with the latter is the Kəs, which is of variable length, 10 feet being probably the minimum and 16 the maximum.

Clear pieces of Douglas fir *(Pinus murrayana)* are the material chosen in the preparation of these fish traps and of all those which remain to describe. Once a suitable fir trunk has been split into portable sizes the wood is allowed to remain a few days in the water, after which it is converted with the help of the bone wedge (fig. 75 *bis*) into long and very slender rods which are then shaved smooth with the knife and assigned to their respective places in the structure. The encircling pieces are of spruce (*Abies nigra*) and are wattled to the longitudinal rods with the usual wattup or spruce root.

Fig. 75 *bis*.

* These reservoirs are called *yuta-sKai*, a contraction of *yutat-əsKai*, "it (recipient) lies down stream."

† This, of course, varies with the depth of the stream.

The nazrwət and its correlative, the Kəs, are exclusively designed for the capture of the salmon. A second fishing device, less restricted in its use, is the *'kûn-tzai.** It works on the same principle as the *yutas*Kai or terminal fish-box. It is a large cylindrical basket about 15 feet long and at least four in diameter. Its bottom end is made of sticks radiating from the centre, while its entrance is provided with the tapering conduit or "heart," as it is called by the natives, which we have already noticed in the *yutas*Kai. Only in this case it is much longer, since the apex or inside end of the truncated cone-like aperture reaches almost to the middle of the whole basket. To make the safe keeping of the fish doubly sure, the converging sticks of this inner conduit are made to project inside beyond the small hoop to which they are fastened. These pin-like stick-ends easily dissuade the fish from trying to escape.

The 'kûntzai was formerly used in connection with beaver trapping, and to-day it does duty in several localities against the musk-rat. In such a case the lattice work is made of sticks so broad as to resemble laths more than rods, while the interstices between its component parts are so small that they leave no room for the rodent's snout should it attempt to gnaw off pieces of it. As an additional measure of safety for the trap, stones are also scattered on its bottom, upon which the game is said to direct its attention in the hope of effecting its escape. When used as a trapping implement these baskets are laid in the bed of sluggish rivers or creeks previously jammed with branches and boughs of coniferous trees.

But what we are presently concerned with is fish trapping. The 'kûntzai are used here (Stuart's Lake) in conjunction with the nazrwət. They are likewise deposited in the bed of the stream, but with their mouth or entrance end in inverse positions relatively to the direction of the current. I think that no words of mine can better explain their use and respective positions than the accompanying diagram showing both nazrwət and 'kûntzai weirs with their hurdle corrals and baskets. *A* is the 'kûntzai weir which is semicircular and extends to the middle of the stream only. For this reason, though it is built on the same principle of piles and braces as that of the nazrwət, the necessary strength is more easily obtained. Its shape precludes the possibility of being latticed as the former, yet every issue is carefully stuffed with spruce boughs *B* and *C* alone are regular hurdles similar to those forming the corrals of the main or up stream barrier. *D* represents a partial trellis left open at the proper intervals to receive the mouth of the 'kûntzai *e*, which are laid

* Apparently a contraction of *ə'kûn-əstzai*, "fish-ova are lying down," which etymology is hard to explain, since those fishing implements have (*now* at least) no relation to fish ova.

down in parallel order to the number sometimes of ten or twelve. Immediately facing the row of basket entrances a large beam *F*, hewn on the upper side only, partly floats on the water and is partly supported on the forks of piles driven in the bed of the river.

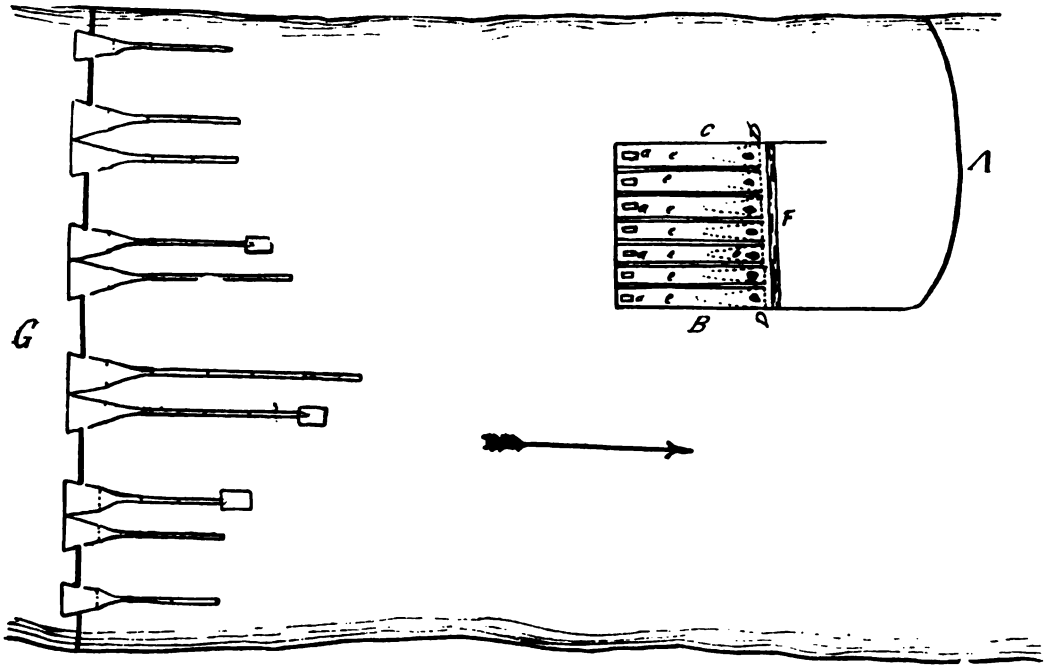


Fig. 76.

So much for the apparatus. Now as to its working. The fish, which is constantly following its way up stream finding any further progress impeded by the staking across the river *G*, remains there almost stationary during the day feeling shy of the nazrwət traps prepared for its capture at night. So it frequently happens that within the space intervening between the complete and the partial weirs large numbers of the fish have congregated ere the sun sets. Therefore natives, manning as many canoes as are available, drive it by dint of noise and by well directed strokes in the water, first into the corral *A*, *D*, *F*, and then to the cylindrical baskets wherewith it is secured. Then, at a given signal, one man from each canoe jumps on the beam *F*, and lifts up the entrance end of the baskets as a precaution against the possible egress of a few fish, while his partner returns by canoe to the opposite end of the trap to empty it of its contents. A lid or door *a* there prepared on the top side of the trap facilitates that operation. The lifting up of the 'kûntzai at the entrance extremity is the work of but a moment, inasmuch as it

chiefly results from the dropping in the water of the large stone *b*, which keeps it sunk to the proper depth.

Both the nazrwət and the 'kûntzai are serviceable in such places only as the outlet of lakes or shallow streams where the current is slow enough to permit of the erection of the necessary weir. Where this is impossible, a third and even more ingenious device—since once it is placed in position, it does all the work of itself—is resorted to. Lattice work projecting a few feet only from the shore is erected in the water, connected wherewith is laid on the bottom a tobogan-like basket with an opening near its curved end. The fish passes through this into an uncovered canal-like conduit leading into a large latticed reservoir where it is caught. The apparatus becomes more intelligible by a glance at fig. 76 wherein we have a sectional view of the whole. The lines marked

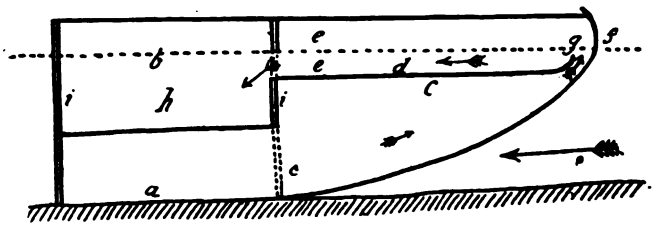


Fig. 76.

a, and *b* show respectively the bottom and the surface of the water. The upper part of the entrance basket *c* is flat and serves at the same time as a bed for the canal *d* which is formed by the addition of two long hurdles *e* on either side of the main or lower basket top. The salmon having entered at *c* soon finds its way upstream blocked at *f*, where the basket is rather narrow. But, as its instinct is decidedly against the wisdom of a backward course, as soon as it becomes aware of the free passage prepared at *g*, therein it runs and thence to the trap *h* laid out for its capture. *i* stands for one of the stakes which hold up the trap or reservoir while they secure the whole structure against the action of the current.

This fish-trap is called *ɔs*, and it does also good service against the land-locked salmon and other minor fish, such as trout, ling, etc., in such streams as are favored with a strong current.

Where the river is of a more sluggish character, a fourth device, called *we*, is resorted to. Though differently constructed, it works on the same principle as the preceding. Its use requires the building of a regular weir or staking across the entire width of the stream, and several such traps are laid out, side by side, pretty much as is done with the nazrwət.

The diagram fig. 77 gives a longitudinal section of this fishing contrivance, which, after the details furnished above, hardly needs a word of explanation. It suffices to follow the smaller arrows of the figure to understand the movements and account for the capture of the fish. Let me simply add that all the component parts of this trap are originally distinct and separate. They are merely kept in their proper place by means of willow bark wattlings.*

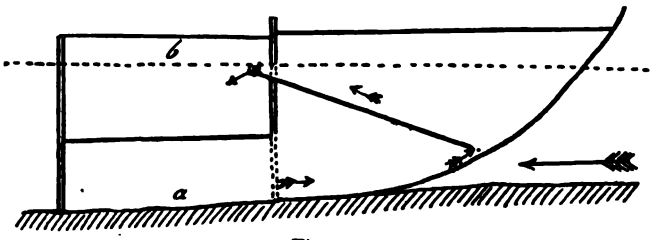


Fig. 77.

Less complicated than any of the preceding fish-traps is the *thé-sKai* (laid down on the bottom), which is also of latticed work and whose general appearance cannot be better described than by comparing it to a coffin (fig. 78). Its catching device consists of a sort of trap-door attached on the inside to the top of one end and slanting down until it almost touches the bottom of the box-like apparatus. This door is so arranged that it slightly yields up to pressure from the fish and shuts down on it once it has entered. The thés-Kai is used in shallow streams only.

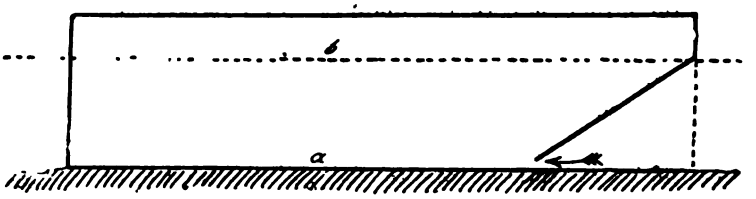


Fig. 78.

A sixth method of salmon fishing which is likewise practicable in a few localities only is that wherewith a *to-sKai*,† or pot hanger basket has to be employed. "In some places where the stream contracts to an insignificant width and, in escaping from its rocky embankment, produces a fall deep enough to temporarily impede the salmon's course upwards,

* In the accompanying diagrams, the smaller or inner arrows show the course of the fish, while the larger ones point to the direction of the current.

† A contraction for *to-asKai*, "it (a recipient) stands up."

the Carriers simply bridge the fall over and with bark ropes suspend therefrom a sort of lattice, seven or eight feet wide, the lower extremity of which is curved up like a pot hanger (fig. 79). When the fish attempts to jump over the fall, he strikes the latticed barrier and drops back into the basket-like bottom."*

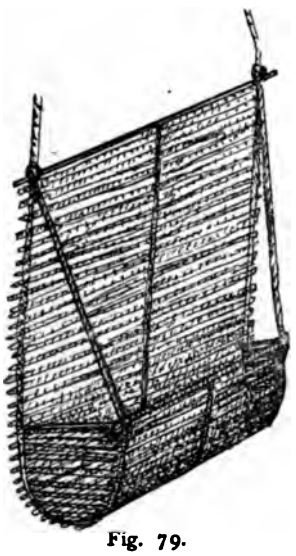


Fig. 79.

Lastly, where none of the above described modes of capturing the salmon are available, the Carrier or TsiɬKoh'tin has still a seventh expedient, more inconvenient and less profitable it is true, left at his disposal. This is fishing with the bag-net (fig. 152). Unless the run of salmon be exceptionally large, this method is rather tedious, and either dire necessity or the passion of a sportsman only can be adduced as an excuse for this kind of fishing, inasmuch as it is impracticable except at night. I still remember coming up some ten years ago, the mighty Fraser then swollen up to the brim by the July freshets. As we were making very poor time painfully poling up stream, I had resolved to profit by a beautiful moonlight to compensate by night boating what we necessarily lost on account of the slowness of our progress during the day. As we neared the Indian village we were making for, we frequently sighted from a distance human forms standing motionless on every available rocky promontory projecting into the river. Upon approaching them, we would perceive that they were intently gazing on one spot in the water, and when questioned as to their success, their almost invariable answer would be: *Sukrak! thallo hulɔR!* "Not a bit; there is no salmon.!" They were bag-net fishing.

Where the natural rocky projections are not pronounced enough wharf-like scaffoldings are erected for the convenience of the fishermen. Some such are to be seen on the HwotsotsənKwah which evidence no mean engineering capabilities.

In describing the Déné fishing contrivances, I have occasionally used the foot measure as the best, because the most common, means of determining their dimensions. Useless to say that this is not the recognized standard of length measure among the natives. Before proceeding further, it may not be irrelevant to enumerate their various measures.

* The Western Dénés, p. 129.

They are :—

1. *Horwə-thisni*,* the fathom, measured from end to end of the arms extended.

2. *Ne-tayo*,† the half-fathom ; from the middle of the chest to the tip of the fingers.

3. *Ne-t'sû-'kət*, ‡ the smaller half-fathom ; from the breast to the extremity of the hand.

4. *Ne-kran-'kəz*, ‖ the yard ; from the shoulder to the end of the fingers.

5. *Ne-t'silla*,§ the cubit ; extremity of the hand to the elbow.

6. *Ne-lla-tcən-'kə*R,** the hand-length ; the hand up to the wrist.

7. *Tîltzə*R,†† is the width of the fourfing ers slightly stretched out. It is a net-mesh measure.

8. *U-'kwə-sthan*,‡‡ the finger-width. It is obtained by laying on the object measured as many fingers pressed together as may be necessary. It is the smallest Déné measure, and is resorted to in connection with pieces of tobacco, of bread, of costly cloth, etc.

The largest and most commonly employed is the first named, *horwə-thisni*, which serves to measure houses, fish-traps, nets, logs, etc.

Another measure of length of a more complex nature is obtained by pressing one hand over the breast and reckoning from the tip of the other hand to the elbow of the folded arm. It is therefore equivalent to three-quarters of a fathom.

To preserve their salmon the Carriers and Tsi[Koh'tin have recourse to the well known method of drying. After the head has been cut off, they open and clean the fish, after which they expose it for one day or two to the rays of the sun. The spine and vertebrae are then extracted, together with the flesh adhering thereto, which is destined for the dogs' larder or used as bait when trapping. The fish is next furrowed inside with a sharp knife as a precaution against putrefaction, and, two wooden splinters having been driven through the flesh so as to keep its inside constantly opened, it is dried beneath rough sheds by the action of the sun and air aided by the fire and smoke underneath.

As for the heads, which are considered by many as the *morceau délicat* of the salmon, they are cut open and smoked or their oil is extracted in this wise : After long willow twigs have been spitted through them, they

* Lit. "along it it is embraced ;" verb. noun.
† "Man-chest."
‡ "Man-breast-on."
‖ "Man-arms-half."
§ "Man-elbow end."
** "Man-hands-stick (wrist)-after."
†† "It straddles," fourth category of nouns.
‡‡ "It-over-it (long obj.) lies," a verbal noun.

are deposited in the water on the sandy shore of the lake or stream till they reach an advanced stage of decay. The stench they then exhale is simply asphyxiating. But not so with the natives, it would seem, since they do not recoil from collecting them and, after having slightly exposed them to the action of the sun as a means of evaporating the water they have absorbed, they submit them to a thorough boiling in large bark vessels and gather their oil in bags made of salmon skin. This they greatly relish, and have recourse to whenever they wish to enhance the natural succulency of their service berries and other fruit. To a civilized palate it is simply an abomination.

LAND ANIMAL TRAPS.

While the fauna of Northern British Columbia could be more varied, it is nevertheless abundant enough to relieve the more pressing needs of the Indian tribes stationed within its borders. With one single exception all the larger mammals on whose meat the prehistoric Dénés subsisted are still to be found there. By this exception I refer to the elk (*Cervus canadensis*, Erxl.) which the Carriers assert to have been indigenous to their present territory, but which has long disappeared from among them. Philologically speaking its successor is the horse, which both Carriers and Tsiꞁkoh'tin call a domestic elk (*yézih*, elk, *ɣi* dog or domestic animal), while the Tsé'kéhne see in the noble animal nothing but a "big dog" *ɣi-tco*. From an economic standpoint however, it is now replaced by the moose (*Alce americanus*, Jardine) and the cariboo (*Rangifer caribou*, Linn.)* The deer (*Cariacus virginianus leucurus*) which is unknown to the Tsé'kéhne and rare among the Carriers is exceedingly plentiful among the Tsiꞁkoh'tin. But Providence has given the former two valuable mammals which are practically wanting among the latter, I mean the mountain sheep (*Ovis montana*, Cuv.) and the mountain goat (*Capra americana*, Rich.) whose native names are *təpe* and *əspai* respectively. Other animals which are sought more for their meat than their fur are the hoary marmot (*Arctomys caligatus*), the ground-hog (*A. monax*, Linn.) and last but not least the hare (*Lepus americanus*). The porcupine (*Erethizon dorsatus epixanthus*) was formerly hunted for the sake of its quills which were greatly prized as an article of ornamentation.†

Most of the other mammals hunted by our Dénés are valued chiefly for their fur, though the meat of almost all is appreciated as an addition

* The moose is called *təni*, and the caribou, *kwotzih*, by the Carriers.

†The marmot is called *tətin*; the grounp hog, *'kani*; the hare, *kɔR* and the porcupine, *tət'quk*.

to their provision store. Prominent among them is of course the beaver (*Castor fiber*, Linn.), which is called *tsa* by all the Western Déné tribes. Its small congener, the muskrat (*Fiber zibethicus*, Linn.), is the beaver of the children and the poor, to whom it is known as the *tsé'két*. However a much more precious game even than the beaver is the black bear (*Ursus americanus*, Pallas), called *ŝas* by both the Tsé'kéhne and the Tsi¡Koh'tin and *s̄as* by the Carriers. Our Western Dénés, who usually prove so cowardly against a human enemy, are so courageous when matched with almost any wild beast, that among them he would not be considered a man who would be afraid of a bear. Personal encounters wherein bruin comes out second best are by no means a rare occurrence here, and not a few Carriers still bear the marks of the bear's teeth and claws. Even the grizzly (*U. horribilis*) is no terror to them. I have here at my side an Indian who has killed one with a revolver, while I am well acquainted with another, a most reliable man, who by his fearlessness and *sangfroid* put to flight a bear of that species with which he had been sitting face to face for perhaps a quarter of an hour without receiving as much as a scratch from the monster, and without having used the shotgun which he had not had time to load. The main point in such awkward circumstances is not to betray the least fear and to look one's adversary right in the eyes. Show any degree of hesitation and you are lost. Although no two species of the grizzly bear are known to science, it might be, however, that the *shyas*, the bear of which I am speaking, is but a variety of *Ursus horribilis*, inasmuch as the Indians pretend to know another and much more formidable one which they call *tsa-rana* or "he busies himself with the beaver," by allusion to its favorite occupation, beaver hunting. This animal they fear, and so far they profess never to have killed any adult of the species, but to have occasionally seen a few. It is, they say, much larger than the *shyas* or common grizzly; its heel is proportionately narrower and the fore end of its paw much broader. It is worthless as an economic item, as it emits a most offensive smell.

The other fur bearing animals sought after by the Western Dénés are the marten (*Mustela martes*, Rich.), the fisher (*Mustela canadensis*, Linn.), which the Carriers call a "big marten," *tcənnih-tco*, the otter (*Lutra canadensis*, Turton), the wolverine (*Gulo luscus*, Linn.), the lynx (*Felis canadensis*, Rich.), the fox (*Vulpes vulgaris*), the wolf (*Canis lupus occidentalis*), the coyote (*Canis latrans*), and the two small carnivores, the ermine (*Putorius vulgaris*, Linn.), and the mink (*P. vison*, Brisson). In addition to *washi*, its regular name, the lynx, whose ancestors are believed to have had intercourse with women, is often half jocosely called *sûnté*, "my first cousin" by the Carriers. As to the different

varieties of foxes and wolves, they are recognized and differentiated by adjectives, not distinct names, in the native tongues, as they are founded merely on colour, not, as with the dog, on anatomical peculiarities. It is a well known fact among our aborigines that, for instance, red, cross and black foxes are found in one and the same litter, so that it seems naturalists should not see more difference between a red and a black fox than they do between a gray and a white bull-dog.*

When not chased or killed by chance as happens in the course of one's travellings, the above named fur bearing animals are procured either with

Fig. 80.

traps or snares. At least three varieties of the former contrivances, all of genuine Déné origin, are still in general use, and a fourth, the bear

* It should be mentioned here that aboriginal usage prevents the hunter from killing for himself any of the largest animals, especially such as are chased for their meat. After his game has been brought down, he will invariably give it to one of his companions, or if he happens to have none, he will cache it up against wolverines or any carnivorous animals and return to the village. Then he will say to any one whom he chooses to favour with his spoils: "In such and such a spot in the forest I have shot a cariboo for you. Go and fetch it." To act otherwise would be equivalent to courting the scorn of every hunter of any standing in one's place.

trap, though now a thing of the past, is still remembered by old men. Its main or fall part consisted of trunks of small trees united into a sort of lattice work by means of muskeg pine saplings interlaced through them. To ensure additional efficiency for the structure, large stones were laid over it, heaps of which are still to be seen in several places, generally close by the banks of salmon streams. I can find no native in a position to satisfactorily explain the mechanism of this trap. All I can gather is that it was very effective, not only against black bears, but even against grizzlies.

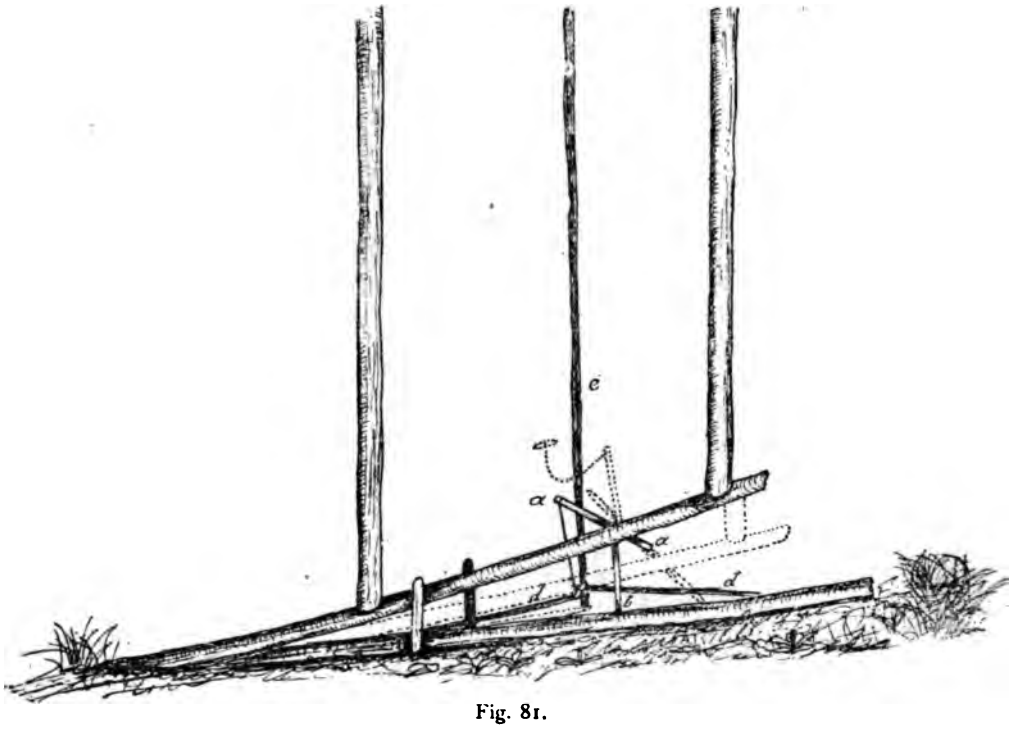


Fig. 81.

To secure martens and other small land game, the Carriers never use but the trap shown in fig. 80, which is very simple in construction. It is merely composed of a fall stick *a*, one end of which is thrust in the ground in an oblique direction, and which springs down on the transversal or ground stick *b*, through the falling off of the pole *c*, resting upright on the bait stick *d*. To prevent the game from getting at the bait otherwise than through the trap, a rectangular enclosure is erected with small pickets generally against, or close to, the bole of a spruce or pine tree. Should the fall stick not exactly correspond in position with that lying on the ground, the marten might survive the springing of the trap and

eventually effect its escape. To guard against such an accident, two stakes *e* are driven in the ground on each side of the falling apparatus. The use and working of the weight pole *f* need no explanation.

Much more complicated, as may be seen from fig. 81, is the action of the lynx trap. The device causing the capture, if not the death, of the game, is identical with that of the preceding, save that two weight poles instead of one are used. But the principle of the apparatus itself is altogether different, and might be pointed out as an evidence of no mean ingenuity. Although I have faithfully outlined in dots the working of the trap while in the act of springing, some further explanation of it may be necessary.

The general principle governing its action is the balance principle. The fall stick being pressed down by the weight sticks, thereby forces up the furthest end of the lever *a*, which is balanced on the post *b*, acting as fulcrum. As an immediate consequence, the string button *c* (fig 82) is started up and at once arrested in its flight by the horizontal sticks *d* engaged between the button and the perpendicular pole *e*. The reason of the springing of the trap is now easy to understand. The lynx, or fox, upon trying to get at the bait laid on the ground a little distance off within a picket enclosure, is bound to tread on the trip stick *e* which is thereby disengaged from the pressure of the button, which immediatcly whirls up yielding to the action of the weight poles on the lever, as shown in the dotted outlines. Both the post and the perpendicular pole *e* are stuck in the ground, and the latter, as well as the weight sticks, are set up through the branches of the tree under which the trap is prepared.

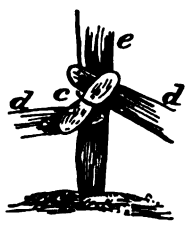


Fig. 82.

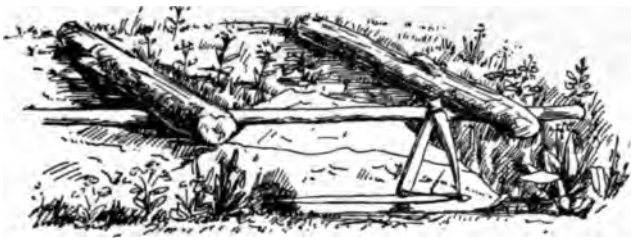


Fig. 83.

A somewhat different setting of the same trap is obtained by engaging the trip stick *above*, instead of *below*, the middle of the button piece. In this case no bait is provided for the game, but the trip stick is thoroughly rubbed over with castoreum, by licking which the animal springs off the lever, whereby the fall stick slips down on the base.

A modification of this trap is occasionally used by a few to capture the beaver. But as the Crees are credited with its invention, no further mention of it is necessary.

Fig. 83 represents a kind of trap differing in every particular from the three already described. It is proper to the Tsé'kéhne and does service against marmots. As shown in the cut, it is usually set in front of the animal's den, and its action or working apparatus has some resemblance to the common figure four trap. Its trip stick *a* is laid across the entrance of the marmot's den and is disposed so as to form a right angle with the left side of the spring stick *b*. Of course this is concealed from view with dry grass, leaves, moss or any other available vegetable material. In order to give even a clearer idea of the mechanism of the trap, its com-

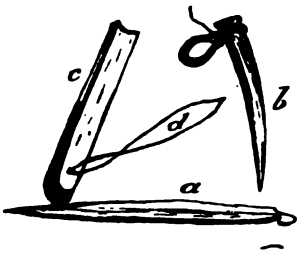


Fig. 84.

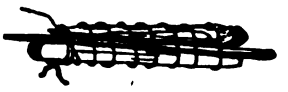


Fig. 85.

ponent parts will be found separately drawn in fig. 84. Let it suffice ot add that, while the fall stick is looped to the springing piece *b*, the small end of the latter is at the same time notched in the trip stick *a* and connected with the post *c* through the double string *d*, which presses in the extremity of both trip and spring pieces.

These traps are not hastily constructed on the spur of the moment with any chance material taken at random from the immediate vicinity of the spot where they are set. They require some little care in their preparation, and they are therefore made at home, and carried about with their different parts tied together as shown in fig. 85.

SNARES.

Whilst we are occupied with the divers contrivances invented by native ingenuity to capture land animals, it may be well to give some idea of the Western Dénés' methods of snaring the same. To such as may be tempted to call in question the appositeness of such minute details, I would beg to point out that the aborigines, whose technology we are studying, are pre-eminently huntsmen no less than fishermen; and to call complete a review of their industrial implements, which does not

embrace their various fishing and hunting contrivances, would be equivatent to supposing well constituted a body lacking nerve or bone. Besides giving us some idea of their proficiency as craftsmen, they enable us to witness, as it were, the workings of their mind as applied to their means of providing for the necessaries of life. So that those very details which may appear unimportant to the superficial reader, add in the estimation of the scientist, a psychological interest to a study which is primarily technological. What has already been said of the Western Dénés' fish or animal traps has led us to the conclusion that, if those aborigines are wanting in the appreciation of the beautiful, they are by no means devoid of the faculty of judging and selecting that which is best suited to the attainment of their ends. A review of their snaring devices cannot fail to confirm this impression.

At least eight different methods of snare setting, generally varying according to the nature of the game, obtain among the single Carrier tribe. I leave it to the following figures to explain the details, and shall content myself with noting *en passant* that which they cannot tell.

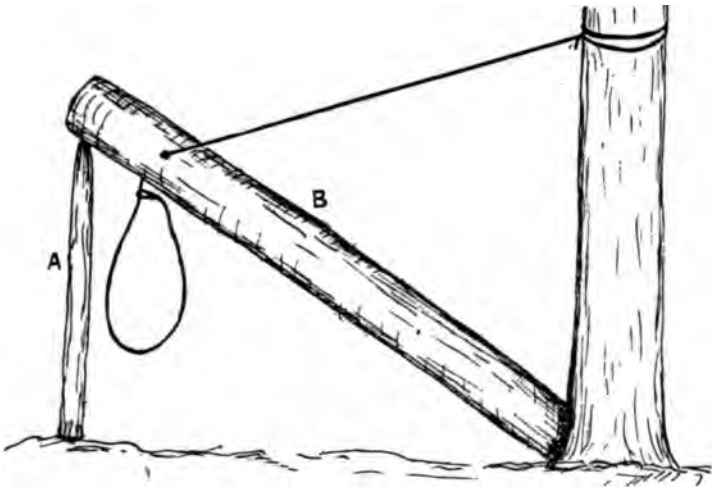


Fig. 86.

Figs. 86 and 87 represent bear-snares * whereby the game is either choked down on the ground (fig. 86) or flung up in the air (fig. 87). The action of the former is exceedingly simple, though it cannot fail to prove very effective. Of course it is clear that the bear upon getting engaged in the noose, which is in all cases held in the proper position through

* The root for snare in general is *pij*, and this word is suffixed to the name of the game for which each snare is intended. Euphony demands that it be preceded by an *m* ; therefore bear-snare is *ɔ̄ɔs-mpij* ; lynx-snare, *washi-mpij*, etc., in Carrier.

small strings lashed to the bushes near by, will, to free himself therefrom, pull forward or backward. Either movement must result in the fall of the post *a* and thereby of the beam *b*.

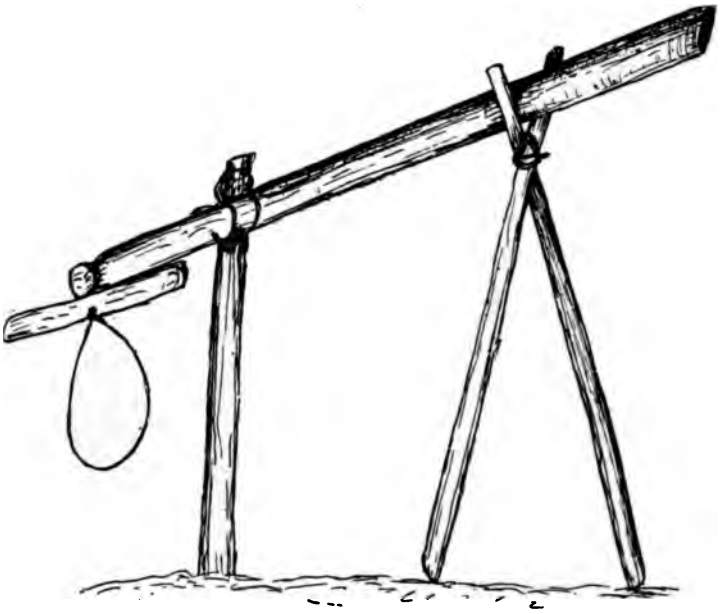


Fig. 87.

As to the second mode of setting the bear-snare, it may be necessary to explain that as soon as the game is noosed up by the falling of the crossed poles, he will naturally, in his efforts to disentangle himself, struggle for a support for his paws so as to annul the action of the noose. This is provided for him in the shape of the wooden piece noticeable under the small end of the lever. But as the role of the hunter is not one of mercy, he has taken care, prior to setting his snare, to bore through that piece of wood a hole large enough to ensure its slipping down with the contraction of the noose. So that by pressing down on it, the animal only hastens its own death. The manner of lashing the lever or balancing pole to the post is shown in Fig. 88. It is reputed the safest and is adopted with regard to all other snares requiring a similar appliance.

The setting of the cariboo snare cannot be simpler. As shown herewith, it merely consists in a noose attached to a stout stake (fig. 89) with which the game scampers away, and becoming engaged among fallen or standing trees chokes himself to death.

Until a few years ago, the Tsé'kéhne were wont to use these snares extensively and with no mean results. As many as forty or fifty were

set in a line through such defiles or passes of their mountains as were the most frequented by the roaming bands of cariboo. After two of their most active hunters had been deputed to watch at either end of the line, the others, numbering fifteen or more, would, by loud shouting and firing of guns, drive the reluctant game to the snares where it was captured.

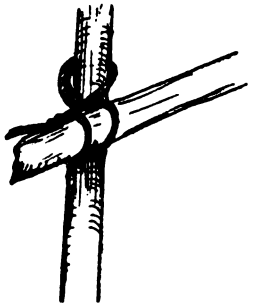


Fig. 88

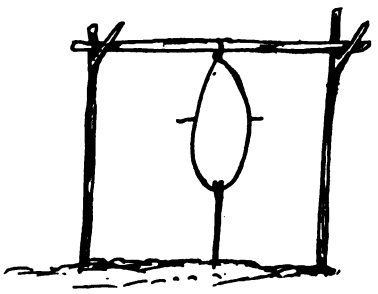


Fig. 90.

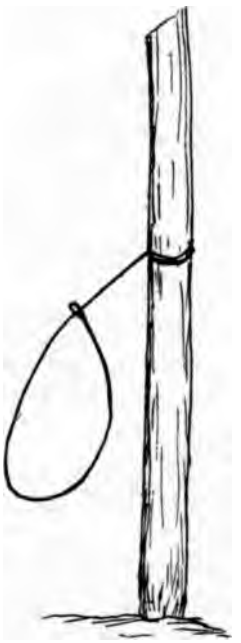


Fig. 89.

In figs. 90 and 91 we have snares very differently set, though they are intended for the same kind of game, viz.: the lynx. The working of the apparatus is in the first model identical with that of the cariboo snare. The little stick planted in the ground is destined to no other purpose than that of holding the noose in position with the help of the two side strings.

Fig. 91 though more complicated in appearance is no less easy of understanding. It is composed of two levers balanced on their posts, the end of the main or snare pole being engaged under that of the other, which is prevented from yielding to the weight of its larger end by the temporary stick *a* set thereunder. The struggling of the lynx when caught in the noose will cause this to drop off on the ground,

whereby the small end of both levers will spring up, leaving no possible chance of escape to the game.

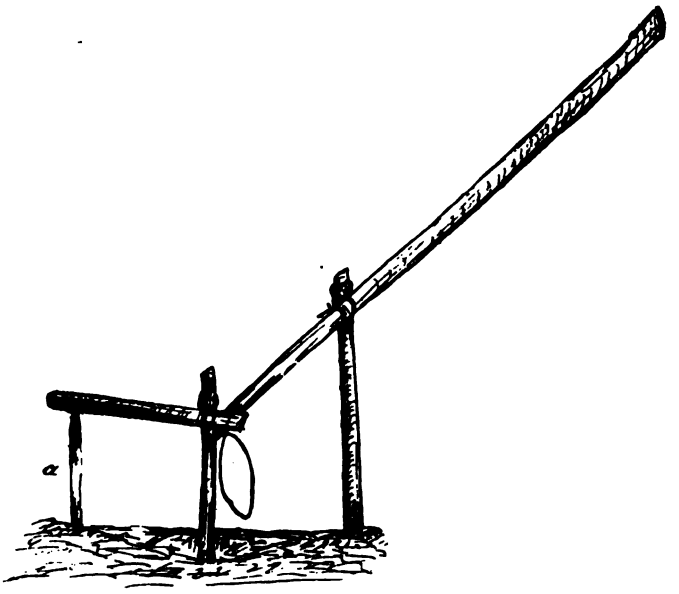


Fig. 91.

The fox snare (fig. 92) is likewise based on the balance principle, and needs no further explanation than this: The snare string above the noose

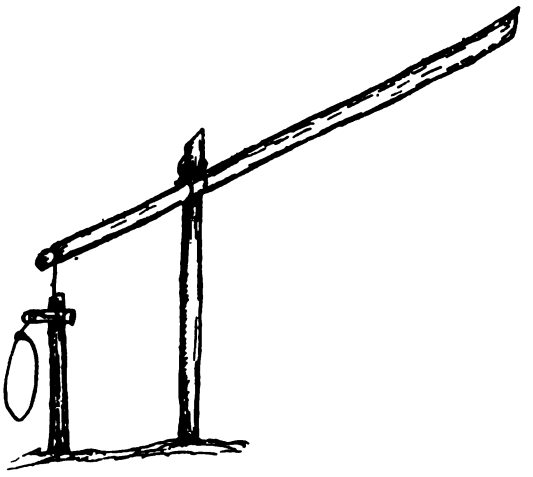


Fig. 92.

is wound round a stake solidly driven in the ground and a detachable transversal piece of wood in such a way that it unrols itself by the

slightest movement on the part of the noosed animal. This connection between the transversal and the horizontal sticks I have tried to illustrate

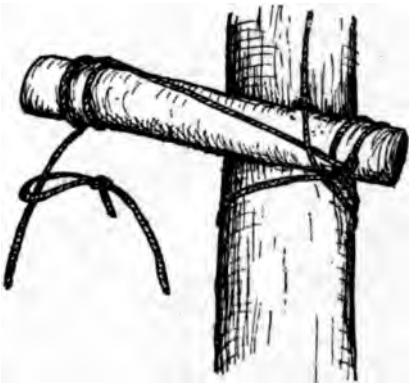


Fig. 93.

by fig. 93; but I think that its working requires to be seen to be fully understood. This snare does also good service against marmots.

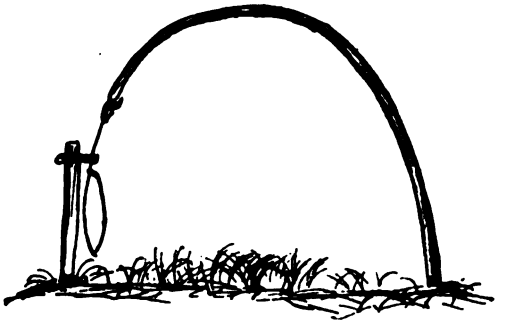


Fig. 94.

Fig. 94 represents a mode of snare setting usual in connection with the latter game only. It needs no explanation, since the lever of fig. 92 is simply replaced here by a bent down switch.

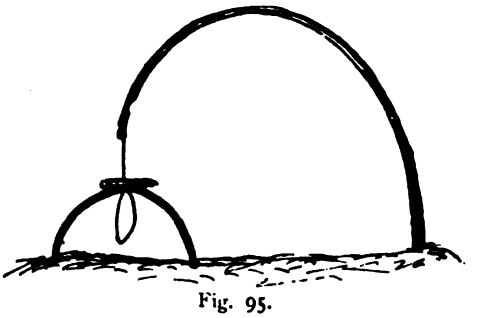


Fig. 95.

Lastly fig. 95 gives us an idea of the rabbit snare as it is commonly

set by our Carriers. The method is identical with the preceding, save that a switch forming a semi-circle is substituted for the stake to which the movable cross-piece is temporarily fastened. Of course this necessitates a change in the position of the latter which in this case is laid horizontally over the apex of the hoop.

The strings of the cariboo and bear snares are made of moose or cariboo skin strands, generally four in number. As a protection against moisture or any other deteriorating agent, they are in most cases wrapped with thin strips of willow bark. Hempen twine such as is for sale at any H. B. Co. fort nowadays serves against any species of minor game.

Before leaving this subject, it may not be amiss to mention that even waterfowl were formerly sought after by means of snaring devices. Ducks and grebes were then the coveted game. The snares consisted in a noose cord of vegetable fibre attached to a stick firmly driven in the bottom of the piece of water, more generally in such shallow places as the fowl ordinarily frequent when feeding.

Waterfowl of any larger species such as geese and swans, especially the latter, are said to have been secured in olden times, by an ingenious stratagem which cannot be better described than by relating the following fragment of the Carriers' national legend wherein the famous hero ʒstas plays such a wonderful role.

"In the course of his travellings, ʒstas came upon a family consisting of the father, two sons and a daughter. One day, the old man sent his sons to try their chances at catching swans in his hereditary fishing-place. The young men, who had already heard of ʒstas' wonderful deeds, said to him: 'Cousin, we always lose our time in our attempts at catching swans. Our father wants some to make for himself a head-dress and a breast blanket* for the winter. People say that you generally succeed in any enterprise you undertake. Come then, and help us.' ʒstas readily consented, and went out with them.

"When they had reached the family fishing grounds, they perceived eight swans lazily gliding on the water. 'Have not you taken a rope along with you?' asked ʒstas. Upon which they pointed to a long rope which had been left there for future use in a similar emergency.

"Presently ʒstas donned a head-dress made of the head and neck of a swan, and, taking the rope with him, swam slowly towards the swans imitating in every point their movements. Then he deftly tied the feet

* See the chapter on Dress and Personal adornment.

of five of them to his long rope without as much as awakening their suspicions, and swam back to the stake driven in the bed of the river to which he secured the end of his rope. Being now sure of his game, he took off his head-dress when the swans perceiving their mistake took to their wings, but were soon arrested in their flight by the retaining rope and stake. They were then taken by the wily stranger.

"The young men who had on previous occasions tried the same trick without avail, were delighted at the success of their guest, so much the more that nobody before him had been able to get by this method more than four swans at one time. They therefore invited him on another day to give them a further proof of his ability, and even to outdo himself if that was possible. Much flattered at their encomiums, ʒstas this time tied the legs of no less than eight swans. But as he was swimming back to attach the rope to the stake, he unwittingly lifted off his head-dress, upon which all the fowl flew off taking up with them ʒstas who was thus carried very far away into the countries beyond the horizon."

The story then proceeds to relate how, new Vulcan, having let go the rope, he fell down upon a rock wherein he sank and was buried alive.

Whether this or any analogous mode of securing waterfowl was really practised by the prehistoric Carriers cannot, of course, be now positively stated. Strange as it appears, some such stratagem may have been resorted to, since we read that in China waterfowl are caught by wading in the water up to the neck with one's head hidden in a gourd and then seizing the bird's legs to finally draw it down in the water without ever revealing one's personality.* Be that as it may, the modern Carriers know it only by tradition. They now prefer to build small circular huts of coniferous boughs or even walls or cairns of stone in the favorite haunts of the fowl behind which they hide and by imitating their call, prevail upon them to approach within shooting range when they are easily dispatched.

I have enumerated the fishes and land animals trapped or otherwise hunted by our Western Dénés, and described the various devices made use of to secure them. I leave it to the following list of the names of the lunar months in two dialects to furnish the reader with some hints as to the time when they are generally sought after.

* See *Six Legendes Américaines identifiées à l'histoire de Moise, etc., par le R. P. Petitot, Missions de la Congrégation O.M.I.*, Paris, 1877, p. 741.

NAMES OF THE TWELVE LUNAR MONTHS.

IN CARRIER.	IN TSÉ'KÉHNE.
Sa-tco, the big moon.	*Int'sih-sa*, moon of the wind.
*Tcəz-səl.**	*Yastəse-sa*, moon of the snow-storms.
*Tcəz-tco.**	*Ahta-ĥnza*, moon of the golden eagle.
Cin-uza, moon of the spring.	*Ratqé-ĥnza*, moon of the wild goose.
Təkus-uza, moon of the carp.	*S̄as-inza*, moon of the black bear
Tañr-uza, moon of the summer.	*Mənəh-tcé-thɔ'oɟe*, moon when they‡ take to the water.
Késəl-uza, moon of the land-locked salmon.	*Hə'ke-ta*, "the buffalo ruts."
Thallo-za, moon of the red salmon.	*ʒ̄tsiz-ĥnza*, moulting moon.
Pît-uza, moon of the bull-trout.	*Sa-tsətle*, little moon.
ʒ̄oh-uza, moon of the white-fish.	*Sa-tcî*, great moon.
Panrən nət'səKei, "during its half one navigates."†	*ʒ̄'ka'ĥ*, "the fat (of the animals) disappears."
Sa-tco-dîn'ai, "next to the big moon."	*Mə-thən-thən-tsətle*, "what freezes is covered with bare ice."

The first of these months corresponds nearly to January.

The size of the page prevents me from giving side by side with the above the names of the Tsi|Koh'tin months. Their main peculiarities may be thus resumed: March is the "moon when one comes out of the subterranean huts"; April is the moon of the sucker; July, that of the *Kes*, or white-fleshed salmon; August, that of the red-fleshed salmon; November is called "this month we all enter the subterranean huts," and December is the moon of the ice. It will thus be seen that different social habits and occupations have left their impress even on the names of the months such as recognized by the three Déné tribes under study.

OBSERVANCES OF THE HUNTER AND THE TRAPPER.

Prior to their embracing Christianity, the Western Dénés had recourse to various other means of ensuring success while engaged in hunting. Several superstitious practices were observed, the neglect of which was

* The root *Tcəz* is now meaningless. The finals *səl* and *tco* mean "small" and "big" respectively.

† I. e. Lake Stuart is opened to navigation during the half of this month.

‡ I. e. The goslings.

regarded as entailing unavoidable failure. Most of these were based on their regard for continence and their excessive repugnance for, and dread of, menstruating women.

As soon as a Carrier had made up his mind to try his chances at bear-snaring, he separated *a thoro* for a full month previous to the setting of his snares. During all that time, he could not drink from the same vessel as his wife, but had to use a special birch bark drinking cup. The second half of the penitential month was employed in preparing his snares. The omission of these observances was believed to cause the escape of the game after it had been snared. To further allure it into the snares he was making, the hunter used to eat the root of a species of heracleum (*tsél'ép* in Carrier) of which the black bear is said to be especially fond. Sometimes he would chew and squirt it up with water exclaiming at the same time : *Nyûstluh !* may I snare you !

Once a bear, or indeed any animal, had been secured, it was never allowed to pass a night in its entirety, but must have some limb, hind or fore paws, cut off, as a means of pacifying its fellows irritated by its killing.

Speaking of the meat of snared animals, I cannot help remarking that young women having their menses could not eat of their head, heart or hind part without exposing themselves to a premature death through a kind of rabies which was sure to attack them in after years. This infirmity led them to keep tearing off the flesh of their arms with their teeth. If perchance they were favored with a lucid moment, they improved it by making their confession to the shaman. "When young, I ate of the head, etc., of an animal" they would say. Thereupon the medicine man would suck from the body of the patient what was represented as the tabooed morsel unlawfully swallowed, and forsooth the woman was cured !

The heart even of water-fowls was forbidden to similarly circumstanced young women, who had also to abstain from cutting up the grebes which, among the Carriers, are caught each spring in such large numbers. These fowl are full of blood, and their being manipulated by such persons would communicate to the latter either hæmorrhage or unnaturally prolonged menses.

If in the woods with his wife, the hunter would also prefer to see her tear herself up in the bush and thorns, to let her pass in the narrow trail wherein he may have deposited his snares preparatory to setting them. Should she as much as step over without touching them, her mate would certainly consider any further attempt at capturing game as futile and useless.

The skulls of the bears whose flesh has been eaten up are even to-day invariably stuck up a stick or the broken branch of a tree. But the aborigines fail to give any reason for this practice.

If the Carrier was to use traps instead of snares, the observances preparatory to setting them varied somewhat. When martens were the intended game, the period of abstinence from sexual intercourse was shortened to ten days or thereabouts, during which the trapper slept by the fireside pressing down a little stick over his neck. This, of course, could not fail to cause the fall-stick of his traps to drop on the neck of the coveted game! The chewing and squirting up of the heracleum root were observed in this as in the former case. The deprecatory formula was merely changed into *Nyûskuh!* may I entrap you!

When successful, the trapper had to be very careful that no dog touches his prey, which, to avert such a misfortune, he had to hang up a peg in the lodge as soon as this was practicable. Contact with a dog would certainly indispose the game's fellow martens against the traps of the hunter responsible for such a slight.

No superstitious practice appears to have been followed as a preparation to beaver hunting, save that to ensure a larger catch, one-half of each trap was daubed with red ochre. But nobody who does not care to condemn himself to useless efforts at securing any further supply of the game must be unguarded enough to swallow the little patella bone of the beaver. In like manner, if after having captured a beaver, a Carrier has the carelessness to let one of his dogs get at that bone, he may as well resign himself to return home empty handed. During the whole beaver-trapping season, his first capture will infallibly be his last.

Lynx not only was not eaten by the women, but even when once snared, it could not be brought in the lodge through the doorway. Women as well as men daily enter through that passage, and the former must have no intercourse, however indirect, with the feline. So it was introduced by men into the lodge through the smoke hole in the roof. It was touched by men only, its flesh boiled by men and eaten by men. The reason of the aversion of the women for the lynx will appear from the following legend:—

"A young couple of Indians was living in the woods. One morning, as the husband was absent chasing large animals, a stranger of surprising beauty and apparently endowed with superhuman powers came upon the young woman. "Follow me: you shall be my wife," he said to her. But as she was very much attached to her husband, she strove hard not to hearken to him. Yet such were the stranger's charms and hidden powers

that her mind was as if paralyzed in his presence. As she pretended that she had no provisions for the journey, he told her that the distance was short, and that he had plenty in his own place. Whereupon he seized her and she had to follow him. Now the stranger was no other than the lynx. She managed however to snatch from her lodge in leaving a grouse (*Dendragapus franklinii*, Dougl.) which her husband had shot a while before. As she walked behind her seducer, she would pluck a few of the grouse's feathers and down and drop them along thereby marking her trail on the ground. By the time that she reached her new home, the bird was entirely stripped of its feathers and down.

"The lynx's lodge was full of pieces of the fat of cariboo and moose hanging up to dry. Before dark, he went out to do a little hunting a short distance off.

"Meanwhile the young woman's lawful husband who had experienced no difficulty in tracking her, thanks to the fallen feathers and the trampled herbage—for it was summer time—came upon her as she was sitting lonely in the lynx's lodge. She at once told him the story of her abduction by the stranger. At the same time she insisted that the latter was uncommonly powerful, and cautioned her husband against using violence in this case. "We had better try and take him by stratagem, for both of us together are nothing to him," she said.

"She had barely uttered these words, when the lynx came home after a successful hunt. The woman went out to him and said presenting the new comer: "Husband, here is your brother-in-law, for he is indeed my own younger brother." Upon which the lynx asked: "Have I then a brother-in-law?"—"Yes indeed, and a very good one," answered the woman. Then her own lawful husband told the lynx how very pleased he was to see his sister married to so good a hunter and thereby delivered from her first husband who had been living with her against the wishes of all her relations. To confirm the sincerity of his declarations, he presented the lynx with his own quiver full of arrows, keeping only his bow for himself. "I will hereafter see you more than once," he added "and each time I shall make you similar presents."

"The lynx was so pleased that he insisted upon preparing himself his guest's supper.

"Now prior to his return home, the young woman had related to her real husband how the lynx had asked her whether she was having her menses. Lest she may have been tempted to prove unfaithful, she had answered affirmatively, though that was not the case. Hearing this, the lynx had manifested a great dread of her and left her untouched. They

had then, her husband and herself, agreed as to the plan to follow to effect her deliverance.

"Therefore, after they had eaten to their content, she purposely attempted to play with the lynx, while her husband, who was lying on the opposite side of the fireplace, feigned sleep. But each time that she tried to touch the lynx she was sharply rebuked: '*Skranthahoñkrés*,* you will throw a spell over my arms,' he would say. Yet she would not desist in her endeavors to keep him awake so as to render his sleep more profound once he would fall asleep.

"At length after he had been a while soundly sleeping, she motioned her husband with a stick that now was the time to act. Therefore he cautiously seized his bow which was double pointed, as one end of it was provided with a long horn dart while the other had a stone spear head. With all his might, he sank the horn dart into the lynx's breast, while his wife chopped off his head with a stone adze she had kept concealed in her bosom.

"After he had transpierced him with the horn dart, he and his wife turned him over and he repeated the same operation on his back with the stone spear head of his bow. They did not leave him till he had been reduced to a shapeless mass of bone and flesh.

"Ever since, our women have been afraid of the lynx, for he is indeed a ravisher."

In the estimation of the Carriers of the generations gone by, fishing was not fraught with the same perils as hunting, and therefore few, if any, superstitious precautions accompanied it. Indeed the only vain observance which can be mentioned in this connection was that which forbade women having their monthly flow to cut or carve salmon, inasmuch as this was reputed to seriously endanger the health and especially enfeeble for life the arms of the transgressor.

When no shaman was at hand to consult about the quantity of the salmon coming up, either the elements or some peculiarities in the vegetable kingdom afforded them a means of prognosticating the nature of the forthcoming run of fish. Thus a continually rumbling thunder or the early fall of the service-berries portended to them an abundant harvest. I would not affirm that these ideas have no longer any hold on the mind of a few modern Carriers. Those persons who are ***au fait*** with the popular notions current among the lower classes of the Old World will, I think, hesitate before tasking my Indians with uncommon credulity.

---

* *Thahoñkrés* is hard to translate in English. The lynx means that her touch while in her unclean state will incapacitate him for the chase.

CHAPTER VI.

WOODEN IMPLEMENTS.

I may mention as having some relation to one of the objects of the preceding Chapter, namely fishing, the *hwot'səz** and the *tallǝɿ*.† The former

Fig. 96.

is the wooden maul which serves to drive home the piles of the salmon weirs used by the Carriers. It is bottle-shaped, and of the hardest wood obtainable, generally birch (*Bitula papyracea*).

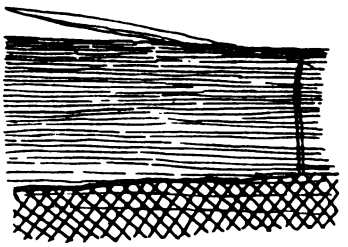


Fig. 97.

The latter is the wooden float attached to their nets. Here we cannot fail to remark that the Western Dénés had in this connection an opportunity of exhibiting at least a minimum of artistic taste, and, as in most cases, did not improve it. The cut (fig. 97) shows the working of the float when in actual use.

Such entirely wooden implements as are unconnected with either fishing or hunting are relatively few and unimportant. Therefore we need not tarry long in their description. Commencing with those which serve recreative purposes, we may refer in the first place to the *tətquh* (fig. 98) of which mention has already been made in the course of a

Fig. 98.

* Second category of nouns.

† A verbal noun almost equivalent to "it floats up."

native legend. It is a rod five or six feet long which is thrown through the air so as to fall as far as possible from the initial point of launching, the distance reached determining the measure of success attained. This game was formerly much in vogue among the Carriers. It is now obsolescent.

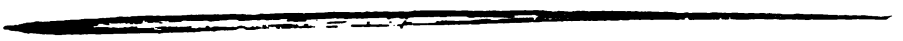


Fig. 99.

A great rival is *nəzəz*, which is played with sticks of almost the same shape, (fig. 99) though much stouter near their fore-end. As they do duty on the frozen surface of the snow, the finest polish possible is aimed at in their preparation. These sticks vary in length from three to six or seven feet, according to the strength, possessed or assumed, of the player. The Carriers are to-day passionately fond of this game, which is played, as a rule, by adverse bands, the stake going over to the party which first attains the fixed number of points.

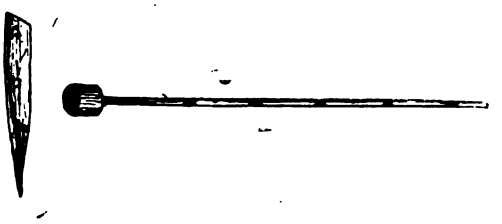


Fig. 100.

Tə'ko· is another pastime which is somewhat childish in character. In most cases it is played by the fireside in the camp lodge during the long winter evenings. Its necessary accompaniments are a blunt-headed stick (fig. 100) and two small, thin and springy boards firmly driven in the ground, one close by each player. The two opposite parties sit facing each other and throw the tə'ko· against the little board on the other side, upon hitting which it rebounds to the knees of the successful player, who is then entitled to recommence and continue as long as luck favors him. Failing to get at the mark, the tə'ko· is handed to the other partner. The number of points obtained indicates the winner. The old men profess to be ignorant of that game, which is probably adventitious among our Indians.

While we are treating of the games in connection wherewith success depends on the skill of the performer, not on mere hazard as with nət'sə·a, atlih and atiyéh, we may mention *'kei-la-pəs* ("encircling willow") or arrow target shooting, though the implement required for its performance

and from which the name of the game is derived would, considered in itself, be classed among the objects which shall form the subject matter of our next chapter.

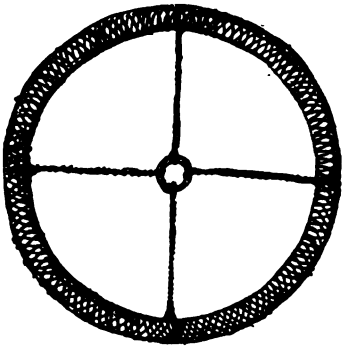


Fig. 101.

This is a sort of open work disk or wheel made principally of willow bark strings, though the frame of the hoop is composed of three or four switches very closely fitting each other and kept in position by a strong lacing of strips of bark. Radiating from the axis, or heart as it is called, are four cords of similar material stretched so as to form a cross (fig. 101).

As this was formerly the great national game of the Carriers, I may be pardoned for giving its rules somewhat in full.

A team of five or six men was matched against another of presumed equal force, and after each player had been provided with a given number of pointless arrows, the disk was set wheeling away by one team to the cry of *tlép! tlép!* This was the signal for the other to shoot at it while it was in motion. Should they fail to hit it, it was returned rolling to the first team so as to give them an equal chance of making at it with their arrows. As soon as the disk had been shot, the real competitive game commenced. The arrows which had hit it, two, three or more, became the stake for the rival team to win over. For this purpose the disk was hung up a short stick planted in the ground near the team who had succeeded in sending home the arrows, and it was aimed at successively by each member of the opposite party. Should any one be lucky enough to shoot it with his first arrow, the stake played for became his irrevocable property. When the target was hit, but on a subsequent attempt of the marksman, the stake was thereby won over, subject to its being redeemed by any member of the opposing team performing the same feat. In this case the game became a draw; the wheel was set rolling anew, and the nature of the stake was determined as in the first instance.

I have never seen 'keilapəs played by others than children and young men. But in times past it had a sort of national importance, inasmuch as teams from distant villages were wont to assemble in certain localities more favorable to its performance in good style. Indeed, until a few years ago the sporting field of some was literally dotted with small cavities resulting from the fall of the arrows.

Fig. 102 represents the device doing duty among the Tsi|Koh'tin as a spindle. Prior to the introduction of European textile fabrics, its uses were doubtless of a much wider description than to-day. As a matter of fact, I have never seen it in actual use except to spin or twist the rabbit skin lines entering into the manufacture of blankets. The discoidal attachment is wanting in the implement such as known among the Carriers.

Fig. 102.

There can be imagined no simpler or more primitive method of lighting fire than that originally obtaining among the Western Dénés. Instead of the somewhat elaborate fire-drill in use amongst the northernmost congenerous tribes, such as the Loucheux and the Hares, our aborigines' apparatus was reduced to a short stick, generally of resinous scrub pine *(P. contorta)* set revolving on touchwood by immediate contact with the hands as is practised by the Wataweita of eastern equatorial Africa.*

Shall I speak of the Western Dénés' canoes? They certainly possess no peculiarity to render them worthy of any mention, unless it be their very rudeness of form and finish. Of course I do not here refer to the birch bark canoes, which among the Carriers and the Tsi|Koh'tin, have gone out of use since the last fifty years or so. Of these I have seen but very few examples, and they were not representatives of their class.

Fig. 103.

West of the Rocky Mountains, the present Déné canoe is dug out of balsam poplar trees (*Populus balsamifera*), and either because the material will not admit of a similar treatment, or because our Indians have not yet learned the method of expanding the sides by the action of fire underneath, as is done by the Coast Tribes with regard to their cedar canoes, they are left almost as narrow at the centre as the tree was while in its

* See "Fire making apparatus in the U.S. Museum," by Walter Hough, p. 553.

original state. A few cross sticks only prevent the sides from shrinking in too much. This want of width, added to the fact that the prow is always made of the broader end of the tree, renders these canoes very awkward in stormy weather on our lakes, inasmuch as they generally compensate in length what they lack in breadth.

Another fact worthy of remark is that the Carriers, who owe to their frequent intercourse with the Coast Indians, much of their technology and all such of their customs as are unknown to the rest of the Déné nation,* should have failed to take the hint from their maritime commercial visitors and build wooden canoes, until they appropriated, some seventy years ago, two rough "dug-outs" manned by a party of Iroquois hailing from the East.

Their paddles offer hardly any noticeable peculiarities, save perhaps the absence of the cross-like appendage at the end of the handle which is common among maritime tribes. This is explained by the different manner of handling the implement. While the Coast Indian when paddling seems to divide his strength between propelling forward with the left hand and pulling backward with the right, the edge of the wooden canoe being made to serve as a partial fulcrum for the lever in his hands, the Carrier, who unconsciously labours under the illusion that he is still manning a frail birch bark canoe, does all his paddling away from his dug-out without ever touching its sides. This exercise necessitates the peculiarly long shaft of his paddle and renders useless the cross-end of the maritime implement. The aforesaid illusion is so patent that even while at the helm, he scarcely ever uses his paddle as a rudder to steer his craft. He prefers to paddle out alternately to the right and to the left, thereby communicating to the canoe a kind of zig-zag course.

Fig. 104.

To return to the description of technological items. In fig. 104 we have an industrial implement whose destination cannot be guessed, inasmuch as its form is rather misleading. It is *not* an oar, but a *'ah-tcəs̄*. This compound word, when understood, prevents the possibility of any misconception as to the use of the object thereby determined. *'Ah* is the Carrier word for a species of fern whose bulbous root our aborigines greatly relish, and *tcəs̄* means "paddle," and by extension any paddle-shaped object. Hence this implement is designed to dig out the esculent root of the fern *'ah*. Yet, in spite of its name, it

* See my paper in the Transactions of the Royal Society of Canada, Sect. II. 1892, p. 109–126.

does frequent service as a mere *pe-yəs̄-hahwozo* * or snow shovel, as it is also used to clear of snow the doorway of habitations and space adjacent thereto. It should be remarked, however, that the prehistoric ·ahtcəs, was much ruder in form and finish than that herewith illustrated.

The bulb of this fern is eaten while fresh and baked *à l'etouffée* in this wise: "The natives dig out a hole about three feet in diameter in the ground, pave its bottom with heated stones over which they strew chips of alder (*Alnus rubra*) bark, and then fill it up with the roots. The whole is then covered with earth and the roots will be ready for the table ten or twelve hours later, that is when entirely cooled down."†

As far as I can ascertain, no such esculent root as ·ah grows in the TsiǀKoh'tin's country. But its absence is more than compensated by the presence there of two very useful tubers, *əsroñh* and *sûntî*, which resemble respectively diminutive oblong and spheroidal potatoes. When these

Fig. 105.

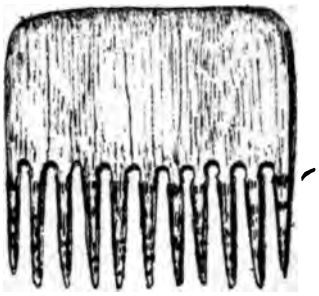


Fig. 106. ½ size.

have reached maturity, they are dug out with the T-shaped tool shown in fig. 105. As may be seen, there is nothing complicated in the nature of this implement, since it is nothing else than a birch branch cut off with its shoot. To ensure greater toughness to the material, its point is generally treated to a slight calcination. Immense numbers of the root are annually gathered. They are either boiled as potatoes or smoked in the house. For the latter purpose a sinew or buckskin line is passed through each of them, and while thus forming strings of vegetable beads, they are hung up near the chimney or the fire hole. The smoking process is rather long, and at its close, the tubers are eaten without any further preparation. I have also seen this method practised among the TsiǀKoh'tin with regard to the smallest of their potatoes.

From the culinary peculiarities of the TsiǀKoh'tin we may pass to their faculty of imitation and adaptiveness as evidenced by the herewith

* Lit. "wherewith-snow-is shaved off."

† The Western Dénés, p. 135.

figured toilet article which had been made and was used by one of them immediately before it was handed to me. If this comb stamps them as good imitators, it must be confessed that it entitles them to no particular claim to be ranked as artists. An examination of the cut will reveal the extreme simplicity of the process of fabrication of this article. A set of small holes have first been drilled with the hole-borer (fig. 130), after which the portions of the wood whose veins had thus been cut asunder have been extracted with the knife leaving out what becomes the tines or prongs of the comb.*

The original comb of the Western Dénés was remarkable for the length of its prongs rendered necessary by their peculiar way of wearing the hair prior to their first encounter with European civilization. In all probability, it was made in about the same style as the above Carrier comb (fig. 107) which is not a toilet article, but served the purpose of ritual observances. To secure success in his trapping or snaring operations, the Carrier had, besides lying down by the fireside, dreaming, etc., to make use of this three-pronged comb, which consists in the juxtaposition of as many wooden pins bound together with sinew lines.

Fig. 107. ½ size.

That our Western Dénés are indeed a self appropriating race is further evidenced by the *tcən·i* or wooden cuirass which the Carrier warriors used to don as a protection against the enemy's arrows. This was composed, as a rule, of dried rods of *Amelanchier alnifolia* (or *Canadensis*) disposed in parallel order and held together by means of cariboo skin lines interlaced through the middle and near both edges. It was identical with the wooden armour formerly in use among the coast tribes from which it was undoubtedly borrowed. I have never seen any; but fig. 53, plate xv. in Niblack's "The Coast Indians of Southern Alaska"† will give some idea of its general appearance.

Composed of the same material was the *'kei-tla-thən*‡ or shield, which was oval in form as the Roman *clypeus*. The mode of manufacture only differed somewhat, as the branches or twigs of amelanchier were very closely interwoven. No specimen is now available for illustration.

Another wooden implement which, though I have seen in actual use, I cannot figure herewith for the lack of a specimen to draw from, is

* The Carrier name of the comb is *tsi-ltzu*, "the head is curried," a verbal noun.

† Ann. Rep. U. S. National Museum, 1888.

‡ Lit. "willow (or birch)-the hand-hold"; 3rd categ. of nouns.

the *tcɔn-əsťɲu* (sticks-interwoven) of the Babines. Its name indicates its mode of fabrication, but leaves us in the dark as to its shape or destination. Imagine a rough arm chair without legs and made of stout, split sticks of willow *(Salix longifolia)* or other wood secured by skin strings, and you have a perfect idea of its form. As for its use, it may be properly pointed out by a simple reference to the plate xx illustrating Ancient Mexican Carriers, in Cyrus Thomas' paper on the Manuscrit Troano.* The packing devices seem to be identical in both cases, while the modes of handling the implement appear to have been different. Our Western Déné women—useless to remark that among primitive peoples heavy work always falls to the lot of the woman—pack from the forehead with a skin line broadening in the middle, and, if the load is unusually weighty, the ends of this line are made to pass around the chest so as to render the burden more manageable. Among the Hwotso'tin, a fraction of the Babine sub-tribe, I have seen a woman thus packing, apparently with the greatest ease, her invalid husband, a man of more than average size and weight.

I shall purposely avoid speaking of the board boxes likewise used as carrying mediums by some of our Carriers, because they are imported from the coast, not indigenous to the Western Dénés.

These other objects which, as sociological items, are also due to the influence of the maritime tribes, but had become naturalized among, and were made by, the Carriers, were the *nɬɲrivɔs*, the *hanɔ'taih*,† and the *t'sak*. The first two are respectively the ceremonial rattle and mask, none of which can now be illustrated from existing specimens. These were almost the only objects of art of genuine Déné manufacture to which I can point, and yet I do not think I unduly depreciate my Indians' artistic capabilities by adding that they were rather below than above the average of similar aboriginal carvings. The masks were used only by mimics accompanying by grotesque gestures and jerking of the head the dance of a privileged few. But the rattles served a double purpose: they did service in connection with a notable's dance, being then held in the hand by the dancing personage himself, and also as an accompaniment to the incantations of the *niɬqɔn*,‡ or shaman. Both implements are, even at the present day, so common among North Pacific Coast tribes that no description of either is needed by readers ever so little *au fait* with American aboriginal paraphernalia It may

* Contributions to North American Ethnology, vol. v., p. 20.

†Lit. "that (round obj.) which is taken off;" the verb *ha-nes'aih* in the potential mood.

‡Lit. "he makes people sing." Not to forget that among most aboriginal races, song and magic are convertible terms.

suffice to refer less informed readers to the plates or figures illustrating Niblack's "The Coast Indians of Southern Alaska";* G. M. Dawson's "Notes on the Haida;†" W. H. Dall's "Masks and Labrets,‡" etc.

Fig. 108 illustrates an implement which, for the lack of another term we must call a rattle, though in shape, use and native name § it widely differs from the above mentioned ceremonial rattle. It is campanulate in form and is composed of a rounded piece of wood, hollowed out in its larger or bottom end and split asunder as far up as that part of it which serves as a handle. It was used by the participants in that aboriginal ceremony, the *thét'-səlrwəs*,‖ which I have described in a former paper.** By slapping against one another, its two halves produced a very sharp rattling sound which could be heard at a great distance.

Fig. 108. ⅙ size.

This is perhaps the proper place to mention another piece of Déné carving, the gentile totem, toad, grouse, beaver, etc., which on great festival occasions was exhibited as a means of attracting offerings, apparently to the said totem image, which were in reality presents, voluntary or due, to the givers of the feast. Of course no specimens of these carvings now exist among the natives.

The *t'sak*, the third borrowed sociological item mentioned above, was a canoe or trough-shaped vessel, sometimes elaborately carved to the arms of its possessor, I mean the totem animal of the notable to whom it belonged, and wherein food was served to the invited guests. This large vessel was brought into requisition on the occasion of extraordinary festivals only. Identical specimens are shown in plate xxxviii. of Niblack's book.

Another kind of wooden utensil called *t'sai* or dish, which was oftentimes inlaid with haliotis shells as an attempt at ornamentation, is also known to have been possessed by a few Carrier families. But I greatly suspect that the vessel, no less than its ornaments, had been bartered from among the coast Indians during the fairs which were periodically held on the borders of the Kitiksons' territory.

This brings us to the consideration of the Western Dénés' household utensils.

---

* Rep. U.S. Museum, 1888.

† Report on the Queen Charlotte Islands. Ann. Rep. Geol. Surv. Canada, 1878-79.

‡ Third Ann. Rep. Bureau Ethnol; Washington, 1884.

§ *ɣadə'ta'*, "from which there comes a slapping sound."

‖ "One runs out."

** The Western Dénés, etc., Pro. Can. Inst. Vol. VII, 1888-89, p. 154.

CHAPTER VII.

BARK IMPLEMENTS.

In no branch of aboriginal industry is the Western Dénés' and especially the Carriers' inferiority as workmen more apparent than with regard to their household utensils. Most certainly no more primitive ware could be imagined, both as regards material and workmanship. It has already been pointed out that no pottery or clay objects of any description ever existed among them. With reference to the Carriers and the Tsé'kéhne, the list of unknown technological items must be extended so as to comprise even the twined basket-work vessels so common among the majority of American indigenous races. These are replaced among the aforesaid tribes by corresponding vessels made of either birch *(Bitula papyracea)* or spruce *(Abies nigra)* bark. Only the coarser variety of vessels, thoes the object of which is but temporary, are made of the latter material, the remainder, those which are properly household utensils, being invariably of birch-bark.

Fig. 109.

Fig. 110.

The most popular vessels among the Carriers are the two herewith illustrated. Both are of a single piece of birch bark, and this must indeed be understood of all birch or spruce bark utensils. The shape and cut of the material previous to sewing are represented in figs. 111 and 112. In the former figure, besides these, the seams and stitches will be

found faithfully delineated. The curved bold lines in the cut indicate the places of cutting preparatory to folding up the bark, and the dotted outlines stand for what becomes the outside edge corresponding to, and

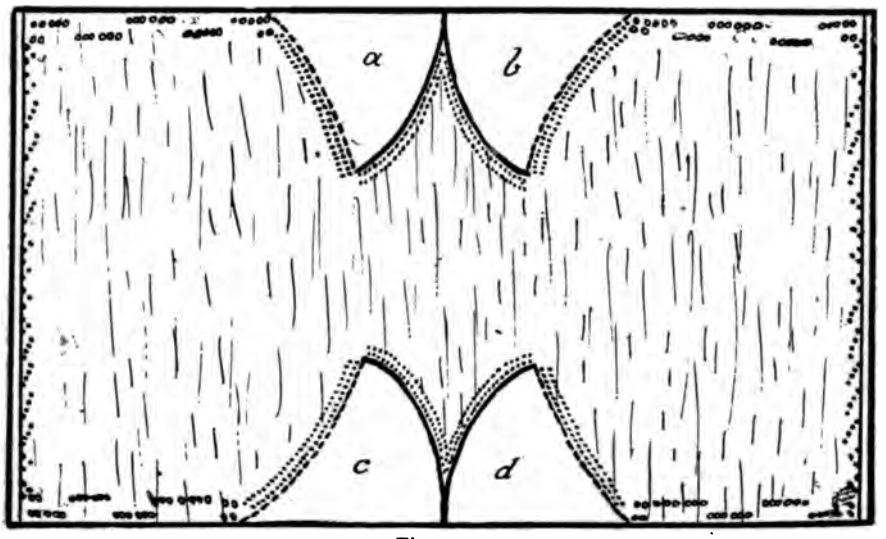


Fig. 111.

sewed with, the tapering piece of bark noticeable in the lower part of the finished vessel. Such portions of the material as are comprised between the bold and the dotted lines—*a*, *b*, *c*, *d*—are cut off once the adjacent

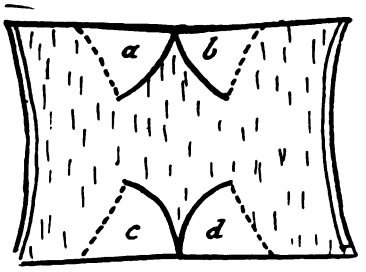


Fig. 112.

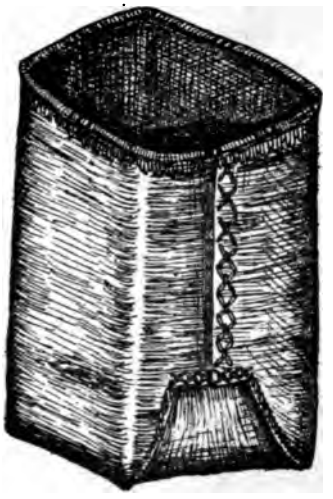


Fig. 113.

parts have been sewed. To give the necessary consistency to the rim, a rod is made to encircle it on the inside. Furthermore, to still add to the

solidity of the vessel and ensure greater neatness of appearance, wattup, or split spruce root, is made to pass through the bark and wrapped very tightly around the rod and rim. In order to avoid striking successively the same grain of the bark with the awl, the holes are pierced each receding backward till four or five have been stitched in, after which the first of a new series is made closer to the brim. To break the monotony of the wattup wrapping, small pieces of *tcən-na-t'qəɟ** or bird cherry (*Prunus pensylvanica*, Linn.) bark are inserted, generally in the middle of each of the four sides of the vessel, enough of their shining surface being left uncovered to be easily visible.

The largest of the bark vessels above illustrated is called a *tcaɟyaɟ*. It has, as a rule, a capacity of from three or four to ten gallons. As regards the uses to which it is put, they are manifold. While the women are gathering berries, it serves to bring home the fruit which has been immediately collected in the smaller or *theɟ* vessel (fig. 110). In the lodge the *tcaɟyaɟ* is also the recipient of clothes, the sewing implements of the women, the family heirlooms, the trinkets of the children, etc. Moreover, it serves frequently to cache up close by the houses any household chattels which it is thought expedient to protect against mice. When thus employed it is suspended, carefully covered with birch bark, from the lower limb of a branchy evergreen.

Some tcaɟyaɟ, while remaining identical in form, materially differ in their style of cutting and sewing. Of these fig. 113 affords a fair example.

None of the bark vessels of the Carriers is provided with a lid.

The second vessel, the *theɟ*, "receptacle," (figs. 110, 112) somewhat resembles the first in form and hardly differs in make, save of course, the altered cutting of the bark. But while all the tcaɟyaɟ are very deep and as nearly quadrilateral in shape as the material will allow, the orifice of the theɟ is oval and the vessel is proportionately more shallow. Moreover, all such specimens as exhibit a pretension to elegance have the middle of their length rims somewhat elliptical. Inserted between the bark and the encircling rod on both narrow sides are two buckskin thongs forming loops to which is attached the neat yarn string—generally adorned with multicoloured yarn tufts—which serves to suspend the vessel from the neck. The theɟ is carried on the breast, while the tcaɟyaɟ is packed, sometimes two at a time, on the back and the occiput. Sometimes, as is the case with the more stylish patterns, the cherry bark ornaments are replaced by dyed horse hair arranged so as to produce geometrical designs.

* "Stick which one tears around," by allusion to the mode of treating its bark.

The theɬ is above all a berry basket, but it does also frequent service as a drinking cup. Its size is subject to great variations, as it may contain from one pint to two gallons. Both tcaɬyaɬ and theɬ are to be seen in every Carrier household, and the latter especially is used so extensively that there is hardly any girl, however so poor, who does not possess her berry basket.

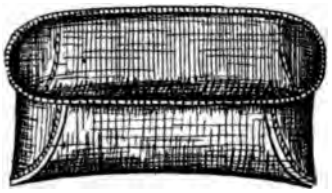


Fig. 114.

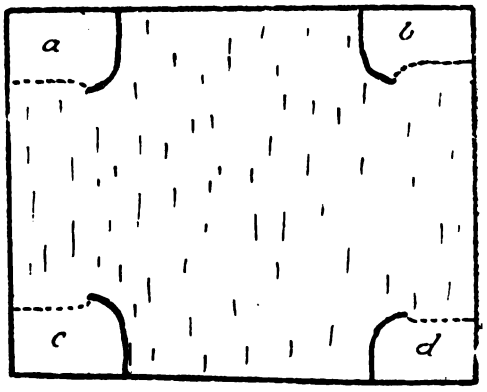


Fig. 115.

The vessel delineated in fig. 114 differs from the preceding in every particular except material and the setting of its rim. It is shallow, and almost rectangular in form, and the seams, instead of tapering from the corners to the centre of the ends as in the above described, remain confined to the corners. Fig. 115 will make it clear that its manufacture offers no serious difficulty. Here again the dotted outlines point to those portions of the bark which are cut off after the vessel has been sewed. As its main destination is to hold liquid, though but for a short time, whether this be water, grease, or berry juice, it is made perfectly water tight. Its native name is *t'sai*, a Déné root, which means tray, dish, or plate. The t'sai greatly vary in size, though they average a capacity of five gallons.

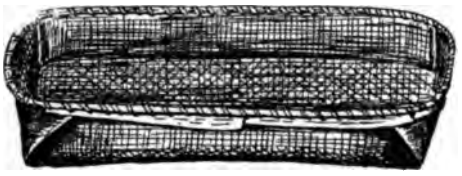


Fig. 116.

Very much resembling this vessel is the *t'ɲəs-t'sai* or fish tray (fig. 116), which however differs not a little as regards both make and finish. It is without a single seam, the corners of the bark being merely folded up,

and the switch which encircles its rim is laid on the outside, instead of the inside, surface of the bark edges. This also lacks the thorough wattup wrapping of the rim, for which is substituted a spiral lacing of a coarser kind of spruce root. To prevent the thin birch bark from yielding too much to the pressure of the rim switch, a double lining consisting of two narrow strips of bark is applied against the vessel's edge both on the inside and on the outside.

It should be added that a few fish trays are also made with seams exactly as the common dish or tray (fig. 114).

The length of this vessel is generally double its width, which, in extreme cases, may reach as much as one foot and a half. It does service principally in connection with the daily net-fishing. The net, which has been left to dry during the day, is at dusk prepared for use at home, the floats and sinkers being there attached in their proper places. The whole is then carefully folded and deposited in this tray, after which the fisherman—or rather fisherwoman, since net fishing invariably devolves on the woman—proceeds to the spot in the lake chosen to set it. When it is withdrawn in the morning, two such vessels may generally be seen in the canoe, one destined to hold the fish, the other reserved for the net, which is folded therein as soon as drawn out of the water.

Fig. 117.

Fig. 118

No vessels of European or American manufacture have so far replaced any of the above described utensils. This is not the case with figs. 117 and 118, for which tin or copper vessels have long been substituted. The former, however, was still to be seen in actual use some ten or fifteen years ago. It was intended to keep water in; hence its Carrier name

thî-thej, "water-receptacle." This circumstance accounts also for its peculiar form—I mean the contraction of its upper part in faint imitation of the neck of a jar. Of course this vessel was made water-tight, the wattup used as thread being, after sewing, carefully pressed in with the finger previously coated with the balsam of the spruce (*Abies balsamea*).

The latter is the original Carrier kettle or boiler,* which is now altogether antiquated. It is seamless; the bark of which it is made has simply been folded up at its four corners and is so retained by means of a few stitches and of an encircling rod on the outside of the rim. Therein were boiled the roots, fish or meat of the family repast, and the aborigines are still loud in their praise of its excellence as a rapid boiler. Naturally enough, the frailty of its material required that care be taken lest it come in immediate contact with the flames. These primitive kettles were not only serviceable, but even much more durable than might be expected. In fact, their only part which was at all liable to get burnt was the wooden rim hoop, which had to be renewed from time to time.

On grand occasions, such as the famous "potlaches" or ceremonial banquets† so much in vogue among almost all the British Columbian tribes, large square boxes imported from the sea coast, were called into requisition. When filled with water and meat or fish, heated stones were repeatedly cast in until their contents were boiled.

The contrivance illustrated by fig. 119 consists of two parts, both of which are of spruce bark. Its object cannot well be understood without some details on one of the Carriers' most important industries, berry collecting and preserving.

Conspicuous among the various species of wild fruit which yearly ripens in profusion throughout their territory is the service berry (*Amelanchier alnifolia*). So important is it in their estimation that they generally call it merely *the* fruit, *mai*. At the end of every summer, the women gather immense quantities of it, first in their theɩ and then in their tcaɩyaɩ wherein it is brought home. When not eaten fresh, seasoned, as a rule, with bear grease or salmon oil, the berries are kept for future use under the form of large, thin cakes resembling plugs of tobacco. They are then prepared by a process which, if primitive, is not the less complicated

As soon as the desired quantity of the fruit has been secured, the Carriers build on the ground, in a sandy spot, if possible, the below

* *Nusai*, sec. root. The name of the modern kettle is *usa'*.

† *Horwɔnɔta*, "the going near" a verbal noun, which confirms what I have written elsewhere, namely that such feasts, no less than several other practices, are of recent origin among the Western Dénés.

delineated boiler and tray. They commence by digging a shallow excavation in the sand into which they lay one end of a rough bark tray, thereby obtaining an oblique inclination for the whole vessel, the lower end of which is alone folded up. Inside the upper half of the tray, a boiler of corresponding width and made of a large piece of spruce bark is erected and secured in position by three sticks driven in the ground on the outside of both boiler and tray. This boiler has no other bottom than that of the tray wherein it stands upright and wherewith it forms an obtuse angle. As a consequence of this last circumstance an aperture is left between the bottom of the tray and the lower edge of the front side of the boiler, that facing the projecting part of the shallow vessel. A few twigs are there deposited which will act as a strainer with regard to the escaping juice of the berries. Once the boiler has been filled up with the fruit, heated stones are cast in which have the double effect of pressing down and boiling its contents. The juice escaping in the outer part of the tray is transferred when necessary to another vessel. The berries in the

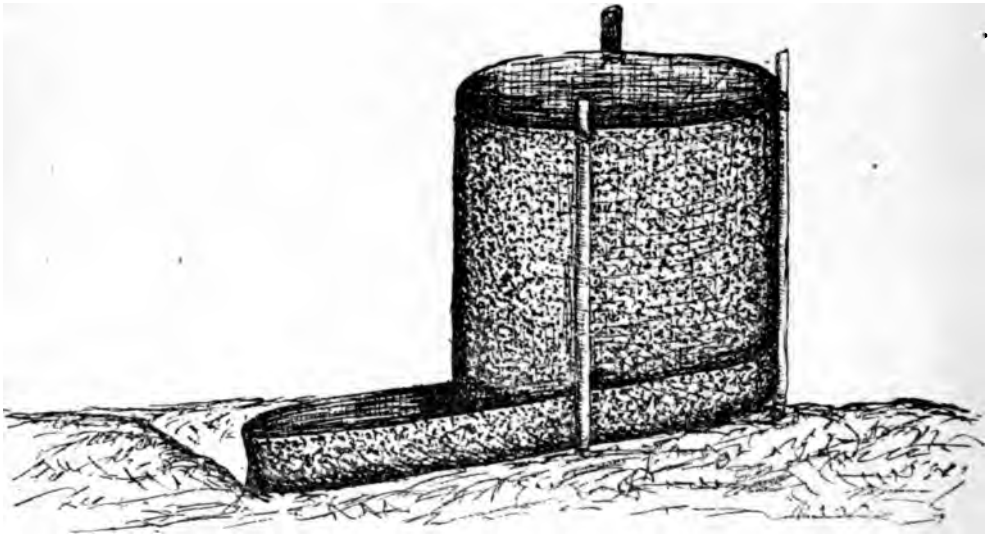


Fig. 119.

boiler having considerably sunk down and the stones beginning to cool, a new supply of both is thrown on top of the mash, which operation is repeated as long as the size of the boiler will allow. After all the juice has thus been extracted, the residue of the berries is thoroughly kneaded, after which it is spread out in thin layers on willow hurdles previously covered with heracleum leaves, and then exposed to the action of the sun and air. By frequently sprinkling the mash with the juice of the berries and letting it dry until it attains the proper degree of consistency,

it finally coagulates into cakes of uniform thickness which are then stored away for future use. When properly prepared, these will keep for years and if sprinkled over with a little sugar, they are of tempting succulency even to others than Indians.

ESCULENT AND MEDICINAL PLANTS.

Before proceeding further in our description of native utensils, it may not be irrelevant to complete our knowledge of the means of subsistence of the Western Dénés by a brief nomenclature of the other esculent berries, roots or plants they use as food, as well as of the chief medicinal herbs which they have, or had formerly, recourse to in case of bodily ailment. Their flora, such as represented in their vocabulary, is somewhat limited, inasmuch as, with very few exceptions, only such plants as have a place in their domestic economy are deemed worthy of a name. Question, for instance, a Tsi|Koh'tin about the native name of a beautiful flower which may strike your fancy, and if it is not that of an edible or medicinal plant, he will look at you wondering if your mind is not getting unbalanced and ask you scornfully: "Do you think that we eat such a thing, that we should have a name for it?" A great many berries they do eat, and therefore honour with a distinctive name These, added to those already mentioned in the course of the present monograph, are:

The small, low-growing blue berry (*Vaccinium myrtillus*) which is common in dry, stony places, such, generally, as are wooded with the scrub pine. These are gathered in the autumn and either eaten fresh, when they are very succulent, or dried and kept until needed for use. In this latter case, they are first boiled in a common tin kettle, then thoroughly kneaded, and spread, without extracting the juice, over small trellis, much as is done with the mash of the service berries. Their Carrier name is *yən-thə-mai̇* or ground berries.

A larger species of blue berries (*V. myrtiloides*) is also much sought after and treated, as a rule, as the small ground blue berries. Such is also the case with the swamp cranberry (*Oxicoccus palustris*) which, though rather scarce here, is none the less appreciated by the natives. The Carrier name of the former is *yaɟtsəl*, a secondary root; that of the latter *əya'-kə-mai̇*, or marsh berry, a noun of the third category.

Təɬqe is a large, dark-colored berry, (*Empetrum nigrum*) somewhat acid and very juicy. When not eaten fresh, or seasoned with bear grease, whole basketsful of it are deposited in long trough-like vessels of spruce bark, tucked up at both ends so as to form provisional receptacles therefor. After they have undergone the usual kneading process, heated

stones are thrown over the mash until it has boiled long enough to prevent its deteriorating with age, after which cakes are obtained by drying on hurdles, as practised with regard to the service berry.

A species of high bush cranberry (*Viburnum paneiflorum*), in spite of its pungency, is also much appreciated by the native palate. It comes to perfect maturity late in September, and is generally eaten with bear grease. But when it ripens early enough, and when the service berries are not kept in dried cakes, it is mixed with them to render them more digestible. The service berry, when eaten alone, is rather heavy on the stomach, and the addition of the cranberries is intended to correct this drawback. The Carriers call the high bush cranberry *tsaɂtsé*.

The soap berry (*Shepperdia canadensis*), which is so unpalatable to a white man, is not the least esteemed of esculent berries among the Western Dénés. It is either eaten raw or dried for future use. In both cases, it requires some preparation to become edible. After it has been mashed in a tin or bark vessel and sprinkled with a little sugar to soften down its bitter taste, it is vigorously stirred with the hand until it springs up into a beautiful rosy foam—whence its name—which is highly appreciated, especially on a hot summer day. If not needed at the time the berries are collected, their mash is put in a spruce bark vessel and boiled by means of heated stones until nothing remains but the roasted residue of the fruit. This is now given the form of the usual plug-like cakes by spreading and drying on hurdles and finally stowed away. When these are required for consumption, they are put in a kettle, dissolved in a little water, and stirred with the hand as in the case of the fresh berries and with similar results.

Two other species of single berried fruit called respectively *tcitcéstetcé** and *noñtza* are generally eaten fresh. As far as I can guess, they belong to the genus *Viburnum*. The first, which grows only on mountainous soil, is black and resembles the service berry, but the natives claim that it is unknown to the whites. The second is a blue berry ripening on very tall bushes.

Nor should we omit in our nomenclature even the berry of the kinnikinik (*Arctostaphylos uva-ursi*), which is prepared for eating by roasting in a frying pan and mixed with salmon oil or the grease of any animal. Its native name is *tənih* in all the western dialects.

The natives also relish any species of edible—and sometimes to us non-edible—berries, such as the raspberry (*Rubus strigosus*), the straw-

* This name, though used among the Carriers, is of undoubted Tsé'kéhne origin.

berry (*Fragaria canadensis*), the black currant (*Ribes nigrum*), which the Carriers call "toad berry," etc. But none of these has the economic importance of those above enumerated.

Besides these and the bulbous roots *'ah*, *sûntî* and *əsroñh* which have been mentioned elsewhere, the Western Dénés find in their immediate vicinity several indigenous plants to diversify their daily *menu* of fish or meat. Chief among these may be quoted the red lily (*Lilium Columbianum*), the bulb of which is used as an article of food by most British Columbian and other American, or even Asiatic tribes. It is cooked by boiling pretty much as is done with potatoes. The natives harvest it almost as soon as it has sprouted out, a short time after the entire disappearance of snow. The Carrier and Tsi|Koh'tin name is *tsa-tcən* or "beaver-stick."

Another plant of a different botanical family whose root is likewise much appreciated as an article of food is the *səs* or sweet flag (*Acorus Calamus*). This root is eaten without any other preparation than cleaning and washing in cold water.

The wild onion (*Allicum cernuum*) is also eaten, root and leaves, either raw or slightly roasted in the ashes. The Carriers call it *t'ɲo-tsə'n*, "stinking grass." So is the root of the dog-tooth violet (*Erythronium giganteum*), which is reputed excellent by the natives. Its Carrier name is *tcilkhe-rez*, a compound word which is unfit for translation.

In the cow-parsnip (*Heracleum lanatum*), and a variety of the same (*kraz*, in Carrier) it is the inner part of the growing stalks which is preferred. It is often used while fresh and unprepared save by the stripping of its fibrous envelope. But if fire is at hand, a Carrier will generally treat it to a slight roasting through the flames previously to peeling off the stalk. The *H. lanatum* is the *kus* of the Western Dénés, a primary root, indicative of its importance in the estimation of the natives.

The marrow of the willow herb (*Epilobium angustifolium*) is also much esteemed, as is manifest from the nature of its Carrier name, Ras. It is eaten before the plant reaches maturity.

Nor do the Carriers disdain the leaves of the Oregon grape (*Berberis aquifolium*), which are simmered in a little water until no liquid remains. This plant, however, was formerly more sought after than is done by the modern Carriers, who call it *ə'tan-tcis*, "simmered-leaf."

Another article of food, cheap because very common, but not the least prized by the aborigines is the hair-like lichen (*Alectoria jubata*),

which grows hanging from most coniferous trees, especially the Douglas pine—hence its Carrier name *tah-ra*, "above-hair." The natives submit it, after gathering, to a thorough washing, till it loses its outer colouring matter. They next mix it with dough as one would do with raisins, and bake the whole. The lichen has then on the cake the same effect as would a copious application of yeast powder on a loaf of bread. The Carriers assure me that, thus prepared, it is very sweet and savory. Prior to the introduction of flour, they cooked it with grease.

Although the shaman's influence was great and his services frequently resorted to among the prehistoric Western Dénés, especially the Carriers, natural remedies such as provided by the vegetable kingdom were by no means despised by them. Nay more, their medical flora was rather extensive, and it may be said to their credit, that several of nature's most valuable secrets were no mysteries to them. Among the herbs or vegetable growths esteemed among them for their medicinal properties, I may mention the following :—

Tatlis (Polyporus officinalis), a fungoid growth from the Douglas pine. It was ground down into a fine powder and taken internally in a little water as a panacea against biliousness. According to the dose, it was a purgative or an emetic. It was very effective; so effective indeed as to be really dangerous. For that reason it has been altogether discarded in favour of milder laxatives such as the bark of the elder *(Sambucus racemosus)*, which is pounded while fresh and taken in cold water.

The young shoots of two species of spruce *Abies nigra* and *A. balsamea*, were, and are still frequently, used as a febrifuge or against any kind of complaint resulting in cutaneous inflammation or eruptions. The shoots are thoroughly boiled and the decoction drank while warm.

A decoction of the boughs of the juniper bush *(Juniperus occidentalis)* is also considered effective against such maladies as fever or measles.

In cases of such cutaneous eruptions as particularly affect young children, the diseased part is thoroughly smeared with the mash of the swamp cranberry *(Oxicoccus palustris)*, and it is claimed that beneficial results never fail to follow within an astonishingly short space of time.

The root of the aspen *(Populus tremuloides)* thoroughly chewed and applied on cuts and bruises, is very extensively resorted to as a sure means of stopping bleeding. Excellent and well authenticated results have more than once attested its efficacy. In urgent cases, the bark of the tree is used instead of the root.

The root of two other plants *ʔi-łaz-reh** a liliaceous plant, and the

* Lit. "Dog—urine—root."

heracleum, though of slower action, is nevertheless reputed effective against hæmorrhage from cuts. It is mashed fine, and a poultice of it is applied on the wound.

Infusions of the bark or leaves of the raspberry bush (*Rubus strigosus*) served as an emmenagogue, while the same parts—or more often still the wood with the bark—of the *Viburnum opulus*, a species of high cranberry, and of the bird cherry (*Prunus pensylvanica*), similarly treated, yielded a fairly good remedy against blood spitting.

They had also several tonics or astringents, among which figured: the wild cherry (*Prunus virginiana*), cold infusions of the inner bark of which were taken as a stimulant; the yarrow (*Achillea millefolium*) and the American sarsaparilla (*Aralia nudicaulis*), decoctions of which are still quite valued; the spearmint (*Mentha viridis*), which was used as a tonic against many ills, and last, not least, the Labrador tea (*Ledum palustre*), which, added to its medicinal properties, was often put to the same uses as to-day the tea of commerce.

In cases of swellings and non-running sores the Carriers use fomentations of the red willow (*Cornus stolonifera*) bark. For running sores and ulcers of any description they profess to have an excellent salve in the decoction of the bark of the osier-willow (*Salix longifolia*) and of the aspen mixed in equal quantities. The mixture forms a milky liquor wherewith the ulcers are first bathed and then rubbed over with the hand, thus causing the extraction of the humors.

Two species of horse tails, *Equisetum hyemale* and *E. pratense*, are valued as powerful helps against retention of urine. Decoctions of the herbs are drank freely until the desired effect is obtained. The leaves of the *uva-ursi* are also used as diuretics, but their properties may have become known among the natives through their intercourse with the whites.

One of the most effective of the native remedies is the *hwollak* (*Artemisia frigida*?) a sage-like plant which is used against local pains and nervous shooting. The leaves are laid over the heated stones of the sudatory, while the patient sits in a reclining position over the steam emanating from them. In extreme cases the leaves are applied while fresh directly to the ailing part of the body, but such are their caustic properties that they cannot be borne more than a few moments.

When no other remedy is available, the stalks of the black currant (*Ribes rubrum*) are cut in small pieces, boiled for some time and the decoction taken as a cough medicine.

To alleviate violent pains, they formerly had recourse to the bulb of

the hemlock *(Conium maculatum)* which they roasted over the ashes, and, after crushing with the hand, they applied to the ailing spot. But owing to the poisonous nature of this root, they now refrain from using it for any purpose.

Of special value to the women as a help after parturition was the *hwuɟrəɟ*, a plant commonly known, I think, under the name of Devil's bush *(Fatsia horrida)*. The bark was mashed while fresh and taken internally with a few drops of water by women just delivered of a child, but whose after-birth had not been, or could not otherwise be, expelled. It did also frequent service as a purgative for persons of both sexes.

Even such delicate diseases as sore-eyes had in the Carriers' estimation a valued antidote in the vegetable kingdom. This consisted in a mixture of the root of the soap berry bush and of the wild rose *(Rosa blanda)* tree. After they had been stripped of their outside bark, the cambium like layer next to the wood was carefully scraped off, mixed with a few drops of clean water and delicately crushed with a flint or a knife till a sort of ointment was formed which was then applied to the eyes. Though sore eyes are by no means rare among the Western Dénés, no application of this sedative ever fell under my observation.

A few other plants or herbs are also used, the medical properties of which have been revealed to the natives by the H. B. Co. people or, later on, by the missionaries. But all those above enumerated are strictly aboriginal medicines.

OTHER BARK IMPLEMENTS.

We now revert to the bark implements. Two models of bark utensils differing slightly in form and much in use from those illustrated in the first part of this chapter are, or were, common among the Carriers. One is the trough-shaped vessel already mentioned as serving to bail in the fruits of the high cranberry. It is of spruce bark, of rude and temporary make, and resembles the *t'ɲs-t'sai* or fish-basket in every particular save that it is deeper. Though it occasionally serves as a boiler with regard to edible berries, it is more often used to cook for their oil the heads of salmon or other large fish.

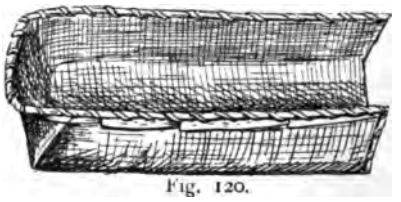


Fig. 120.

The last vessel of Carrier make which remains to describe is now a thing of the past. It was of birch bark, flattish and rectangular, and had but one narrow side (fig. 120). Its brim was, as usual, strengthened by the apposition of a willow switch running along its three sides. It served as a bathing tub for the infants

and, owing to its chief peculiarity, it had to be kept in a slanting position while in use.

The Carrier women originally carried their babes in regular cradles made of birch bark curved up at the narrow end as the basket-tray of our last illustration, save that this part was sewed, not merely stitched in one place as was the case with fig. 120. The bottom of the cradle was prolonged at the broad or open end to serve as a support for the head of the infant. Starting from both sides a hoop of willow half encircled at the proper distance the head of the child, and was intended to allow sufficient breathing room when it was deemed desirable to cover it. The necessary lacings were passed through a band of buckskin bordering the cradle on the outside.

With the advent of the whites these primitive cradles disappeared, to be replaced by the systematic swaddling clothes disposed as in fig. 121, which still obtain among the Carriers. Now, as in olden times, the lacing is done with one string passed through bands of cariboo skin ornamented according to the fancy of the mother. This string is so arranged that by pulling both ends the swaddling envelope is drawn up over the feet of the babe. Progressive mothers—and they form the majority—nowadays substitute for this tightening device strips of cariboo string buttoned at either end over each side of the swaddling clothes.

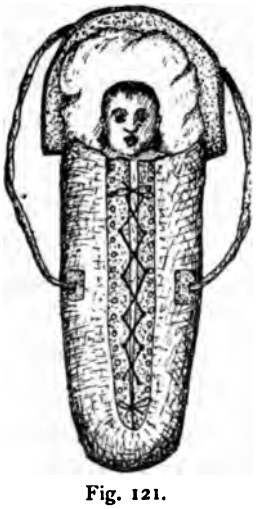


Fig. 121.

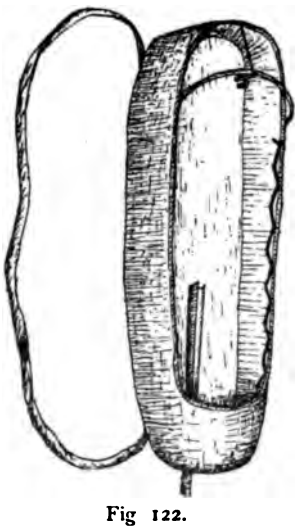


Fig 122.

The Tsi|Koh'tin have preserved to this day their traditional baby-baskets or cradles, of which fig. 122 will give a fair idea. They are made of the twigs of a species of willow, and their bottom is generally

strengthened by the addition of a board. The framework when completed is thoroughly concealed beneath a closely-fitting covering of deer hide sewed on the sides of the basket. As in the original Carrier cradle, breathing room is afforded by means of an osier hoop from which toys or playthings, beaver teeth or nails, etc., hang in sight of the child.

One peculiarity which I think is proper to the Tsi|Koh'tin baby baskets is the bark conduit which may be noticed in our illustration and whose end is to preserve the infant against moisture, and also to reduce to a minimum the trouble consequent upon bringing up such small children.

As the styles of baby cradles differ according to the tribe, even so it is with the mode of carrying them. A Carrier mother carries her child hanging perpendicularly on her back by a strap running across her shoulders and breast, while the Tsi|Koh'tin women carry their baby horizontally on their back and suspended in its cradle by a tump line passed athwart their forehead. In this they simply conform to the custom of their southeastern neighbours, the Shushwap.

The Tsé'kéhne vessels do not materially differ from those of the Carriers, and their mode of treating and carrying the Tsé'kéhne babies tallies also with that of the latter. But the household vessels of the Tsi|Koh'tin have no point of resemblance with any of those I have thus far described. No bark vessels are seen among them, as they replace bark by regular basket-work. I regret my inability to present the reader with an accurate description of their root weaving process. Yet, if memory serves me right, I think that they coil, not twine, the root according to the method illustrated by Prof. O. T. Mason in the Smithsonian Report for 1884 * and elsewhere. However, all the household utensils I have seen among the Tsi|Koh'tin are broad-mouthed and wallet-like, none of them tapering up as some of the specimens quoted by the learned professor.

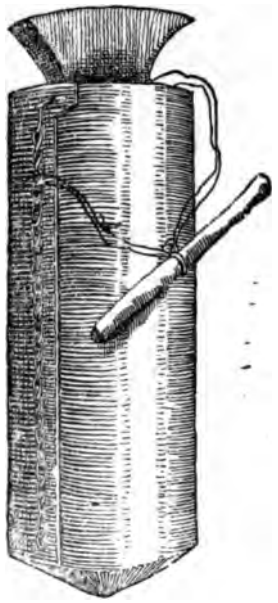


Fig. 123. ½ size.

Their water vessel, the form of which I remember well, is similar to that illustrated on page 18 of Dr. G. M. Dawson's "Notes on the Shushwap people of B. C.," † save perhaps that it is not quite so narrow at the bottom. Many of them are elaborately orna-

* Ann. Rep. Part II., p. 294, plate V.

† Trans. Roy. Soc., Canada, Sect. II., 1891.

mented with geometrical or animal designs. They are generally of about seven or eight gallons capacity.

A second vessel (*t'ɂasqaz* in Tsi|Koh'tin) much smaller and pan-shaped, does duty as a washing dish and receptacle for cooked food principally the starchy bulbs *suntl* and *ɔsroñh*.

A third is elliptical and of about the same diameter across its breadth.

It is used as a washing-tub wherein the babies are made to stand naked to be washed every evening by their mothers.

Before we close this chapter, we should not forget to mention the birch bark *tsa-yu-thej* or castoreum bottle (fig. 123) such as it is used among the Carriers. The object of that implement has already been explained.‡

‡ In the chapter on Bone Implements.

CHAPTER VIII.

COPPER AND IRON IMPLEMENTS.

COPPER IMPLEMENTS.

Rev. E. Petitot, arguing in favor of the contemporaneity in the same part of America of the bronze and the iron ages with the palæolithic and the neolithic epochs, has the following to say :—

"Avant l'arrivée des Européans dans la vallée du Mac-Kenzie, les Couteaux-Jaunes et les Flancs-de-Chien connaissaient l'usage du cuivre natif qu'ils trouvèrent sur les bords de la rivière Copper-mine. Ils s'en fabriquaient des couteaux, d'où leur est venu leur nom. Ils faisaient en même temps usage de la pierre polie. Donc nous avons ici contemporanéité de la *pierre polie* et du *bronze*. De leur côté, les Peaux-de-Lièvre, qui ignoraient le cuivre et qui ne se dounaient pas la peine de polir leurs instruments de pierre, avaient découvert le long du Mac-Kenzie, à l'embouchure de la rivière *L'é-ota-la-delin*, du ferologiste, et ils en fabriquaient des aiguillettes et des alènes de quatre pouces de long qu'ils troquaient avec les Thekkané et autres tribus méridionales des Montagnes Rocheuses contre des peaux d'élan à raison de dix pour une alène." *

It is likely that most archæologists will refuse to concede that the use of copper knives by a savage people entitles the makers to be regarded as having reached that stage of industrial advancement commonly called the bronze age. The use of copper is in this case too limited they will probably say. This reason, plausible as it certainly appears at first, is after reflection rather more specious than convincing. For was not this the case even in the old world? Were not stone weapons largely used there contemporaneously with copper or iron implements? No, answers the antiquarian; each epoch or age was very distinct and strictly consecutive.

Let us see.

In Italy, C. Geikie found early uncoined money (*æs rude*) along with polished stone weapons; and a number of flint knives have been obtained from Etruscan graves. Indeed a piece of coined copper money marking

* *Rapport succinct sur la Géologie des vallées de l'Athabaskaw—Mackenzie et de l'Anderson*; Paris, A. Hennuyer, 1875.

a still later period has been found in an Etruscan tomb alongside with a stone knife. At Bibracte, the most important town of the Ædui in ancient Gaul, scientific exploration has brought to light work on metal and coins mingled with flint arrow heads, polished stone axes and a flint knife. Similar discoveries have been made in many places throughout France.* In ancient Egypt, stone and metal implements were also used contemporaneously.† In the centre and south of modern Africa, the negroes, according to Lenormant "have never known bronze, and work hardly any copper. Instead of this, they manufacture iron wares in large quantities and for this purpose make use of a process which was not communicated to them from the outside. Hence they themselves discovered the method of manufacturing iron, and when they gave up the use of stone implements, they passed to the manufacture of this metal."‡

These few instances chosen among many others will, I hope, suffice to prove that the sharp and almost instantaneous change from one age to another and the strictly successive order generally believed to have been followed in these transitions are, in many cases, more fancied than real. Metal objects were apparently the property of the leaders and the higher classes generally while the lower classes must have contented themselves with the stone equivalents, just as in the Middle Ages only the knights wore steel armour.

That copper and iron were to be found among the Carriers long before these aborigines even suspected the existence of the whites there can be no doubt. But the use of these metals was, of course, restricted to a few fancy objects or working tools. Moreover, in so far at least as that tribe is concerned, neither copper nor iron was indigenous and the former metal only was wrought by its members. Concerning its introduction among the Carriers, I take the liberty of reproducing here a short native legend which I have already quoted elsewhere.§

"In times not very remote, all the Indians (themselves among the rest) congregated at a certain point of the sea coast, around a tower-like copper mountain emerging from the midst of the water. Their object was to decide which tribe should become the possessor thereof. When all had united in shouting, the mountain began gradually to totter, and the Haidahs who are blessed with big heads and strong voices caused it

* See "Christian Anthropology," New York, 1892, p. 324.

† Ibid.

‡ "*Die Anfänge der Cultur*," vol. I. p. 57.

§ "The Western Dénés," Proc. Canadian Institute, 1888-89.

to fall on their side. 'Thus it was,' they add, 'that those Indians secured the copper mountain, and we have ever since been obliged to have recourse to them for what we require of that metal to make bracelets for our wives and daughters.'"

The reference to this wonderful towering mountain of copper, fantastic as it may appear, might perhaps be explained by the existence of the monumental Pillar Rock on the shore of Graham Island, a sketch of which will be found in G. M. Dawson's Report on the Queen Charlotte Islands.* Even in prehistoric times, some Carriers had evidently visited the Pacific Coast, as may be inferred from a few of their legends wherein some peculiarities proper to that region are introduced with a tolerable amount of accuracy. On the other hand, as most of their copper was imported from the coast, it was but natural that, according to the custom of primitive peoples of assigning a fabulous origin to extraordinary objects, they should associate in their narrative the wonderful pillar-rock with the no less wonderful yellow metal.

I might point here to the adventures of a mythic Carrier, a sort of wandering Jew, who underwent many a stirring experience on the Pacific Coast while in quest of a stolen wife, and who is the first personage mentioned as possessing copper. The fact that the possibly historical data hidden amidst the details of that legend are interwoven with many miraculous circumstances, would lead us to suppose that the knowledge of that metal among the Western Dénés dates back from a rather remote epoch.

Be this as it may, I have never met with more than five kinds of copper objects of genuine Carrier or Tsiɪkoh'tin manufacture. These

Fig. 124.

Fig. 125.

are the hair tweezers, the bracelets, the finger rings, the harpoon tips and the dog collars. The hair tweezers † were originally of cariboo horn. They then consisted of two thin pieces of horn given the required shape by means of heating, and tied together at one end with sinew threads (fig. 124). The copper tweezers were of one piece and affected the form represented in fig. 125. The object of both was to remove any super-

* Montreal, 1880; plate ii.

† *T'səɪ-anta*, "grebe-bill," a noun of the third category.

fluous facial hair. "Superfluous" should be understood here as synonymous with "any" hair growing on the lips, the chin or the cheeks, since the Western Dénés kept themselves beardless. The prehistoric Tsé'kéhne, if they are to be judged by their immediate successors, the eldest among the modern Tsé'kéhne, indulged in the possession of a queer looking partial moustache, which was obtained by leaving untouched the hair growing on the upper lip below, and exactly corresponding in width with the septum, while on both sides the lip was otherwise free of hair. The tweezers were worn on the breast, hanging from the neck. They are still to be seen among the Tsiɪʀoh'tin and the Tsé'kéhne.

The Carrier *na-lthan* * or metallic bracelets (fig. 126) were of an exceedingly simple pattern. As the hair tweezers, they were originally of cariboo horn; but as commercial relations became more extended, copper was soon preferred in their manufacture. In later times pewter was even adopted and beaten to the desired shape out of the spoons of commerce. I speak in the past time, because among the Carriers especially, such trinkets are now practically unknown.

Fig. 126.

Fig. 127.

When bartered from the Coast Indians, the copper was generally in sticks or slender bars, which were then wrought by hammering by the Carriers. These bars remain almost unaltered when used to give consistency to the collars of their dog-harnesses.† When not ornamented, these harnesses are probably similar to those in use among the eastern Indians, and as such would hardly deserve any mention. But the Carriers' fondness of parade has long prompted them to add to the original pieces the blanket and collar ornaments which I have thought worth the while to show in fig. 127. Of course these two additions are detachable paraphernalia, which are not generally used, except when reaching or leaving a village. The frame of the upper parts is of copper.

* Lit. "it (of a heavy material) is around."

† *ʔi-t'ɪuɪ*, dog-ropes, 3rd cat. nouns.

Fig. 128 can be adduced as a further evidence of that power of imitation which I have more than once quoted as one of the characteristics of the tribes under study, especially the Carriers. Finger-rings,* it is hardly necessary to say, were unknown among the primitive Dénés; but they no sooner became aware of their existence among the whites than they set upon fabricating them with whatever material at their command. One of the results was the ring sketched above which has been found here, Fort Saint James.

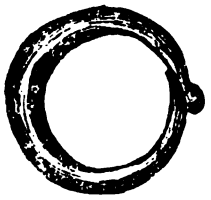


Fig. 128.

IRON IMPLEMENTS.

Whether hematite was known to the Western Dénés prior to their contact with European civilization cannot well be ascertained at the present time. It would seem highly probable that it was among all the tribes but the Carrier, which to-day has no other word for "iron" or iron ore than that used for "knife." Even among the Tsé'kéhne, who call a knife *pés* and iron *tsa-tsoñe* (beaver-dung), it is very doubtful if they ever subjected hematite to any treatment calculated to reduce it to the shape of a working tool. Yet I think I am warranted in asserting that iron implements have been known and used even among the Carriers for at least two centuries, that is one hundred years before they had heard of the whites. The memory of the appearance of the first iron axe at this place (Stuart's Lake Mission) has been kept vivid to this day by the descendants of its original possessor. Their narrative, when shorn of a few excrescences, I believe to be historically true, inasmuch as names of persons and of localities, together with minute particulars connected therewith, are freely mentioned. Their veracity is made still more apparent by the genuine and unbroken genealogy of the present chief of this village up to the first possessor of the marvellous implement. A full account of the deeds of the various personages introduced in the chronicle might prove not uninteresting even to the general reader. For the present I shall content myself with its initial chapter. The chief of Stuart's Lake will be our narrator.

"The first man (*i.e.* Carrier) who ever possessed an iron axe was my grandfather (*i.e.* one of my ancestors). His name was Na'kwəl, and, owing to his rank as one of the most influential notables, but more particularly on account of the great age he attained, he has remained famous among us. He was so old when he died that his hair had turned yellow, after having long been snow-white. He was a most irascible man and

* *La-thəl'tə*, "passed round the finger."

therefore much feared. What his age was when he got the iron axe I cannot say. He must have been a grown-up man and full-fledged "nobleman," since tradition tells us that upon receiving it, he convoked a large crowd of Indians of clans differing from his to a grand ceremonial banquet. Now this can be done only by a təneza· or nobleman. On that occasion, the iron adze-blade was suspended from a rafter over the heads of the invited guests so that they might have an opportunity of contemplating it at ease. The implement was considered exceedingly precious. It had come from some unknown place in the direction of Tse'tcah.* It was thereafter taken great care of, and its possession was the means of considerably enhancing my grandfather's prestige among his fellow Carriers.

"Yet it was lost one day under the following circumstances. Some men of Na'kwəl's family were in the woods cutting spruce branches to cover up the doorway of the winter lodge they were erecting, when the skin line which fastened it to its handle as an adze getting loosened, the blade suddenly dashed off and fell among the branches already cut. By searching among these, the implement must have dropped down in the snow, for it could never be found by natural means that winter."

The story then proceeds to relate how it was subsequently found through the incantations of a medicine man who was richly paid for his trouble, and concludes thus: "This happened a very long time ago, long before my forefathers had heard of the whites."

That this is a fact is shown by a few words attributed to Na'kwəl which, though still intelligible, are nevertheless quite archaic, and also by the following genealogy of Na'kwəl's posterity.

1. *Na'kwəl* must have lived at least two or three scores of years after the acquisition of the iron axe, when he died and was succeeded in a genealogical point of view by

2. *Tcitcanit*, his youngest son, who had two wives and being of a jealous disposition, was secretly drowned by them when in declining years.

3. Tcitcanit was succeeded as *təneza·* or nobleman by a maternal nephew named *Tsalekuɣyé*. This personage killed a man with an iron pointed lance, and was himself killed when he was getting much advanced in years.

---

* Near the Skeena river. See the map accompanying my paper, "Are the Carrier Sociology and Mythology Indigenous," etc.? Trans. R. S. C., Sec. II., 1892.

4. His successor was *Kwah*, who made war and slaughtered hosts of Lower Carriers. By a second wife he had

5. *Atsuʃ*, a second son, who died five years ago, over one hundred years old, since he remembered the arrival of Sir Al. Mackenzie's party in the country. He left three generations of descendants.

Reference has been made to a prehistoric iron pointed spear. Tradition furthermore records the killing, in ante-European times, of a cariboo with an iron or steel knife or dagger. This happened on this lake, some 15 miles from here. Below, the reader will also find figured a steel dagger which came into the possession of the Carriers some 110 or 120 years ago—their country was discovered in 1793. It was instrumental in killing several men and was originally much larger. The handle was also of a different description, the knife being one of a class of steel daggers called in the dialect of the Babines *t'ʃak-nanist'sər*, or "rounded at the end" (of the handle). It probably resembled the instrument represented by fig. 108 *e* of Niblack's "The Indians of Southern Alaska."*

Fig. 129.

The presence of steel implements, even so early and so far away in the interior of British Columbia, is not calculated to disconcert the archæologist, considering the frequent intercourse the inland tribes had from time immemorial with the Coast Indians. Both Cook and Dixon ascribe the introduction of such tools among the Coast tribes to the Russians whose first recorded expedition on the Northern Pacific Ocean dates from 1740. But Na'kwəl's iron axe cannot evidently be attributed to the influence of the Russians, since it had apparently reached this place long before I. I. Behring's expedition was fitted out. Coast Indians must naturally have been slow in parting with such valuable implements. Moreover it should not be forgotten that not more than fifteen years before the advent of the whites among the Carriers, iron tools were still so rare among the Coast tribes that in 1779 a Captain Gray master of one of the Boston trading vessels, is reported to have got at Nootka, on Vancouver Island, two-hundred otter skins worth about $8,000 for an old iron chisel!†

* Ann. Report, National Museum, 1888.

† Christmas No. of the Victoria "Colonist," 1891.

Among the steel implements distinctly Déné in manufacture and actually in use among the Carriers, are the hole-borer or drill, the moose skin scraper and the crooked knife or spoke-shave.

Fig. 130

The first is made with a nail or any available piece of iron securely lashed on the side of a stick or fastened in a slit at its extremity. Occasional holes are obtained by rubbing the drill between the hands while strenuously pressing down the implement. But when a set of fine holes, such as those of the snow-shoes, is desired, the Carriers have recourse, in

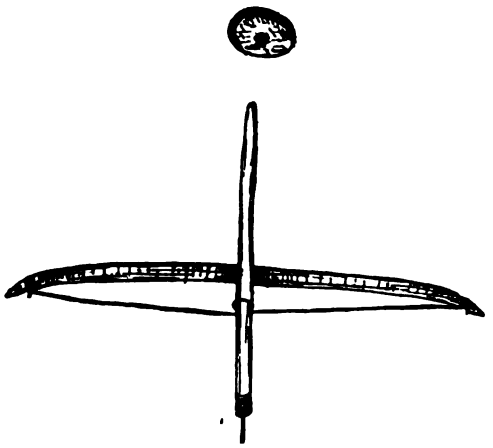


Fig. 131.

addition to the borer, to a small bow and a hard piece of wood which they manage as shown in fig. 131.

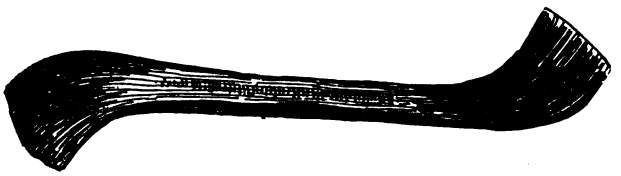


Fig. 132. ½ size.

The name of the tool shown in fig. 132, *ɬnrwəɂ*,* or moose skin scraper, explains its *raison d'être*. It has been patiently ground down to its present shape from an old file.

* Second category of nouns.

Identical material and mode of manufacture have likewise resulted in the accompanying spokeshave or *ɔras*, the "drawknife." It is of the greatest usefulness to the modern Indian, so much so that there is not a house among the Carriers wherein it is not to be seen. They employ it to finish the inside of their canoes, to shave off the rods used in the construction of their fish-traps, to fashion the side and transversal sticks

Fig. 133. ½ size.

of their snow-shoes, and to do almost any kind of manual work in connection wherewith a white man would use a draw-knife or even a common pocket knife. The lower grade of *ɔras* is made of the blade of a table knife. The handle of the specimen above illustrated is of cariboo bone, secured to the blade first by copper wire and then by rawhide lines wrapped around. The whole tool is of native manufacture.

CHAPTER IX.

SKIN OBJECTS AND TWINED AND TEXTILE FABRICS.

SKIN OBJECTS.

Under this head we will consider any native items wherein dressed or undressed skin enters as the chief component part.

Passing references to the treatment of hides have already appeared in the course of the descriptions of the implements used by the Western Dénés to free them of hair, fat or blood. It now merely remains with me to add that after the skin in preparation has been rubbed over with the brains of the animal, it is allowed to pass a whole night steeping in cold water. It is then subjected to several rinsings in hot water, alternating with thorough scrapings, until, being quite dry, soft and pliable, it is given the form of a bag and placed over the smoke of decayed wood or other vegetable matter. Once it has been thus smoked on both sides, it is ready for use.

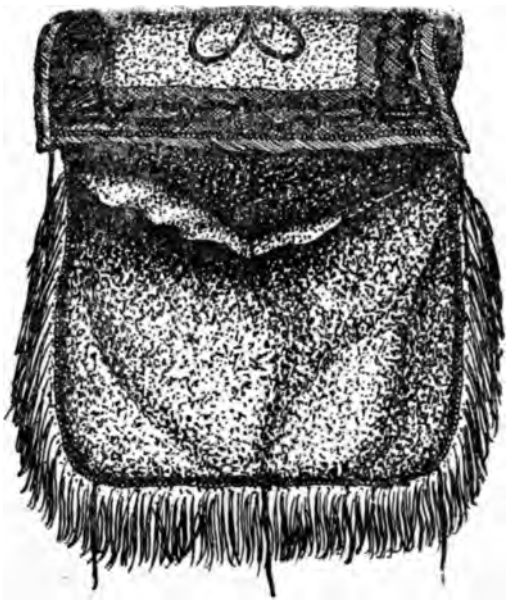


Fig. 134.

Among the Tsi[Koh'tin skin dressing is practically confined to the hide of the deer, while among the Tsé'kéhne moose and cariboo skins

only are tanned for use. Moose is rare within the Carriers' territory, and still more so is the deer. Therefore, with that tribe, mocassins, mittens and gloves, bags, etc., are almost exclusively of cariboo skin. We will here pass over skin articles, which belong to the native accoutrement or wearing apparel, as these shall be treated of in the next chapter.

Confining ourselves to household or non-personal objects, we may mention no less than seven varieties of leather bags or pouches in use among the primitive Carriers. Fig. 134 represents the household bag or *eztjai*. This is generally the property of women and serves to contain the family chattels, but more particularly such as are proper to the women, clothes, pieces of tanned skins, working tools, articles of ornamentation, etc. This bag needs no description ; the cut cannot but give an exact idea of its form. The bead work in some is much more elaborate than in the specimen herewith figured. Before the introduction of glass beads, dyed porcupine quills served to ornament this and all other kinds of skin receptacle. The cover piece of this *eztjai* is also, I am told, a modern innovation. This bag is never used as a packing contrivance.

A variety of the same, but much reduced in dimensions, was formerly the regular badge of widowhood among Carrier women, so much so that the custom which required its use has given the Carriers their distinctive name. Among them cremation was the national mode of disposing of the dead. As a rule, on the morning following the funeral ceremony, the relatives of the deceased, accompanied by his widow, were wont to pick up from among the ashes of the pyre the few remaining charred bones which, if too large for the purpose in view, they did not scruple to reduce by breaking to the desired size, These were then handed to the widow to daily pack till her liberation from the bondage consequent on her new condition. This gruesome task devolved on her for the space of at least two or three years, and in extreme cases was prolonged to a period of some five years. Upon the final giving away of property which was the signal for the cessation of mourning, these bones were deposited with the satchet containing them in a box laid on the top of a funeral column near the village.

Some of these satchets were still in existence a few years ago. Their cover, instead of fitting over the whole bag as in the household *eztjai*, reached only half way down. Its sides were also sewn with those of the satchet itself, so as to preclude the possibility of its contents being accidentally thrown out. Of course, a string was attached to the satchet and passed across the neck or or breast of the packer. A lining of birch

bark also gave the receptacle a certain degree of consistency, and served moreover as an additional protection for the bones.

The regular packing wallet* herewith figured is still very generally used for carrying provisions during long journeys and might be termed the native buffet. It is of two different materials ; its main parts are of undressed moose hide with the hair out, while its sides, top and bottom are of tanned cariboo skin. The skin of the upper part of the legs of the animal is chosen in preference and sewn together, as may appear from a glance at the illustration below. The packing band is also of untanned moose skin. On either side of the bag, ears of tanned skin are pierced each with two holes, the lower one of which is intended to receive the strap when the walllet is not full. The broad or middle part of this line passes athwart the forehead of the packer, and, after sliding through one of the holes at either side of the bag, its loose ends are drawn forward and tied over the breast, so that the position of the burden can be changed at will.

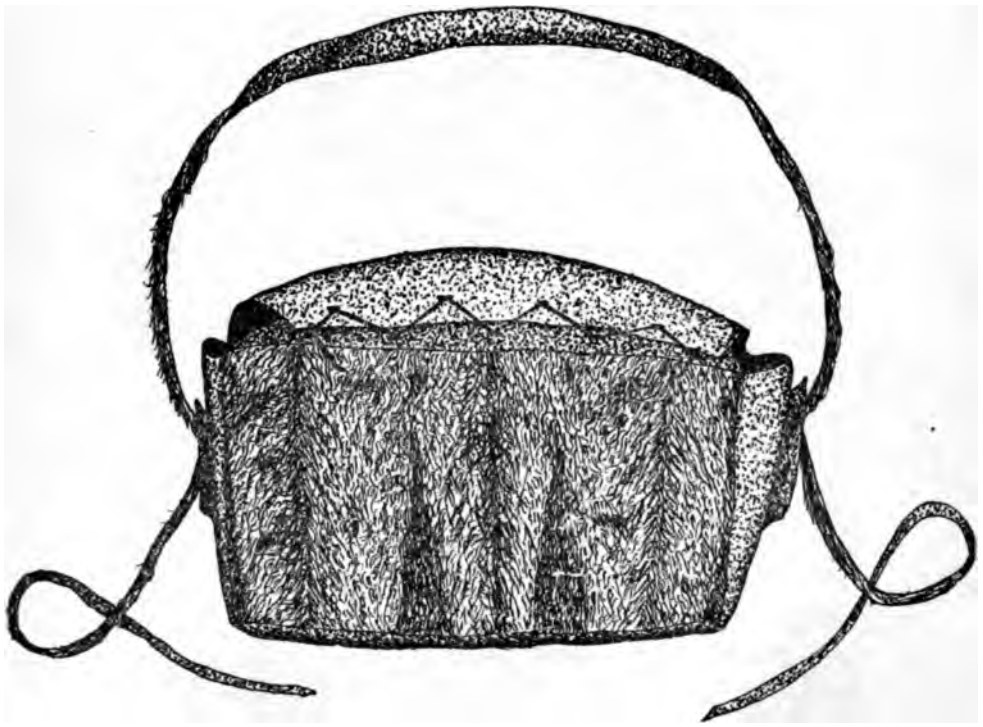


Fig. 135.

* Ɂu'kéz, sec. root.

Not uncommonly these wallets or knap-sacks are made entirely of dried salmon skins sewn together. Once the flesh of the fish has reached the proper degree of stiffness, it is carefully torn off and one of the skins is shredded into fine filaments which serve as thread.

The *ɲu'kéz* generally does duty in connection with heavy burdens, which means for anybody *au fait* with native sociology that it is the appanage of the women. The men have also a packing bag of their own intended as a receptacle of such light burdens as are incident to short trips, and which shall be described further on.

The fourth variety of leather bags is the dog-bag, which is so much like a common saddle-bag that I refrain from figuring it here. No harnessing device is connected with it, it is simply lashed on the sides of the canine with a separate line.

Fig. 136.

Fig. 136 also represents a double-bag; but this is proper to the huntsman. In one end of it he keeps his provision of powder, and in the other that of shot or balls. Both halves of the bag are shut by tying around the strings attached immediately below the common or middle opening. Out of this ammunition pouch the huntsman fills up as often as necessary his powder horn, and his ornamented shot pouch which are parts of his accoutrement.

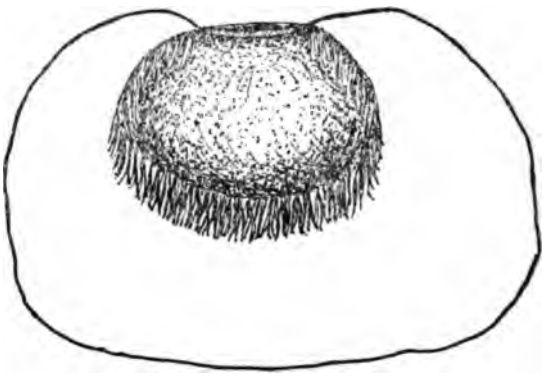


Fig. 137.

Here we have a *Kwən-zəz* or fire-bag. Its use has ceased with the introduction of matches, and its name is now given to a small pouch of different pattern, though somewhat similar in intent. The former served to carry about or keep at home the tinders and parched hay originally

required to start a fire with the fire drill or more recently with the fire steel. Its elliptical form was probably intended as a help in guarding its contents against rain or moisture. As an additional measure of precaution, the pouch was generally carried under the arm pit suspended from the neck.

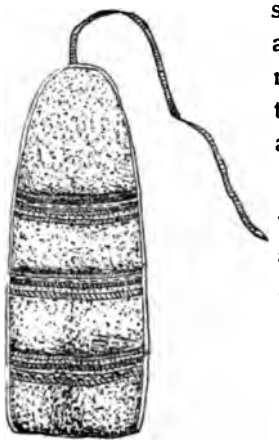


Fig. 138.

Its modern substitute is of common cloth in the form of a flour sack and with two strings so arranged at its mouth that the pouch can be shut by drawing them apart. Matches and tobacco with a pocket knife are generally the only things kept in this Kwənzəz.

Fig. 138 represents a needle and thread pouch. Although originally of tanned skin it is now almost exclusively of black or blue cloth trimmed with ribbons or coloured tape.

To complete our list of skin objects of Déné manufacture, we should add to the above the *pe-ɜ̄ta* (wherein one sits), a sort of cuirass in use in prehistoric times especially among the Carriers. It had the form of a sleeveless tunic falling to the knees, so that it protected the whole body, since those aborigines generally shot kneeling. Its material was moose skin which, when sewn according to the proper pattern, was soaked in water, then repeatedly rubbed on the sandy shores of a stream or lake and dried with the sand and small pebbles adhering thereto, after which it was thoroughly coated with sturgeon glue. Being again subjected before drying to another rubbing over sand, it received a new coating of glue, and after this process had been repeated three or four times, it formed an armour perfectly arrow proof.*

* In his *Appendice relatif aux armes de pierre des Indiens arctiques* published in 1875, the Abbè E. Petitot, speaking of the Dénés of the Mackenzie Basin, says that "ces Indiens arctiques prétendent qu'ils n' ont pas toujours habité sur le sol où nous les avous trouvés, mais qu'ils ont vècu, à une époque fort éloignée, dans une patrie plus belle que la présente. . . . Dans cette terre . . . bien tour dans l'occident, un peuple puissant opprimait les Loucheux et les Peaux-de-lièvre. Ce peuple se rasait la tête, portait de faux cheveux et se coiffait de casques. . . . Ses guerriers se couvraient la poitrine d' une tunique de peau d' élan revêtue d'une foule de petits cailloux coagulès en manière d' écailles (cuirasse); ce qui les rendait comme invulnérables à leurs traits. . . . A cette époque les Déné-Dindjiés faisaient, disaient-ils, usage de lances, qu' ils m' ont dépeintes comme des couteaux fixés par une ligature au bout d' une perche; d'épieux, sorte de cornes munies d' un crochet et également emmanchées; d' arbalétes; de dagues, et enfin de boucliers." Then the learned missionary adds that "*aucune de ces armes offensives et défensives. . . . n'a suivi les Déné-Dindjiés en Amerique.*" The italics are mine, and it is hardly necessary to remark that the line thus pointed out would never have been written had its author been acquainted with the original Carrier sociology. For, as

OBJECTS OF MIXED MATERIAL.

As may be seen by figs. 139 and 140, the Déné drums, though possessing minor characteristics of their own, do not essentially differ from the tambourines in universal use among the North American Indians. In every case we have merely a dressed skin—which is here of cariboo—stretched ove a narrow hoop. The Carrier drum (fig. 139) not only had no bottom strings, but its makers even dispensed with any cord as a means of holding the instrument. The same piece of skin in which almost consisted the whole drum was cut on the reverse or back side into four strips tapering to the centre into regular strings which were knotted as shown above, *b*, and which served as a means of grasping the instrument.

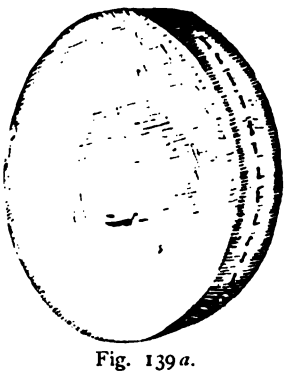


Fig. 139 *a*.

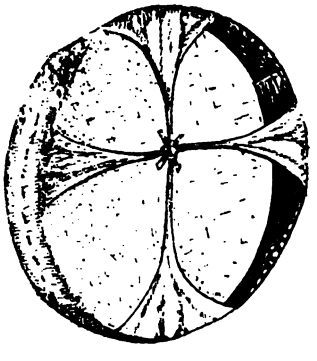


Fig. 139 *b*.

The Tsé'kéhne drum (fig. 140) though apparently a very simple piece of workmanship, evidences much greater ingenuity on the part of its contrivers. Not only does it possess the bottom strings designed to enhance its sonorousness, but these very strings are so disposed that they help not a little in using the instrument. After passing beneath the frame of the drum they are drawn up over it under the encircling skin, and again introduced through the middle of the hoop from which they protrude inside in the shape of a loop through which the thumb is passed

a matter of fact, all the arms and defensive weapons above enumerated had their counterparts on this side of the Rockies but a short time ago. In that "skin tunic covered with small coagulated pebbles," we recognize, of course, the *pe-ista* just described; the lances regarded by Petitot, after his informants, as so very ancient were the *sarthz* spoken of on page 62; the épieux or spears are not materially different: Petitot describes them as "hafted hooks" and it so happens that the Carrier name of these weapons means "hook-sticks." The cross-bows we have likewise seen in use among the Tsé'kéhne, while the daggers and the shields were no less common among the Carriers. Nay more, even the "false hair," or wigs were in vogue here as late as thirty years ago. These will be found described in our Chapter on Dress and Personal Adornment.

with a double object in view: that of helping in holding the instrument and of tightening or loosening the bottom strings at will and thus regulating the sound of the drum.

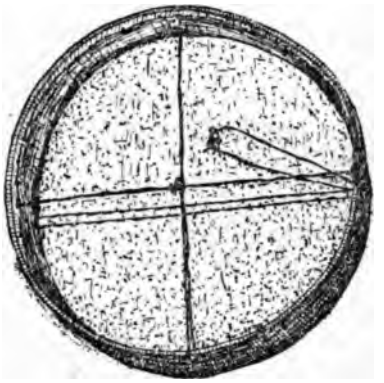


Fig. 140.

That portion of the Carrier—and possibly the whole of the Tsi|Koh'tin—tribes which is adjacent to the Bilqula Indians formerly used square drums. But this circumstance should be regarded merely as a further evidence of the Western Dénés' innate power of imitation. The drums are called *thəñrəle* in Carrier.

Any stick at hand, padded or otherwise, served to beat the drum.

It seems almost incredible that in a country, where for at least five full months every year snow covers the ground, snow-shoes should have been practically unknown until a comparatively recent date. Yet, if we are to credit the natives, this was formerly the case with the Carriers, the most populous, and, actually, the most progressive of the four Western Déné tribes. The Tsé'kéhne used snow-shoes from time immemorial; but we are told that not more than 100 years ago, only the most prominent among the Carriers possessed that indispensable adjunct to winter travelling. Therefore with that tribe winter hunting was formerly well nigh impossible. The natives still relate how their ancestors painfully trudged on trunks of trees chopped down so as to form a continuous line or trail over the snow whenever necessity constrained them to wander any little distance from their winter quarters. I fully expect that their story will task the credulity of my readers, and I give it only for what it may be worth. I am simply repeating here what I have been told many a time.

Be this as it may, the Carriers are to-day as well provided with winter walking implements as they profess to have been originally destitute of

them. Apart from the snow walking stick, they now have no less than four very distinct varieties of snow-shoes *(ʻaih)* each of which is known under a different name. These are the *khé-la-pas*, the *ɲəʼɲu*, the *ʻaih-za* and the *səs-khé*.

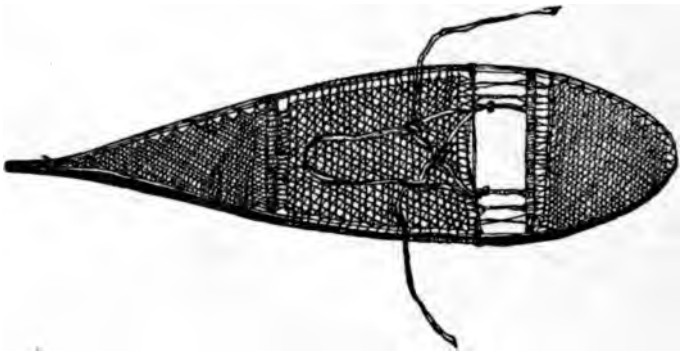


Fig. 141.

The *khé-la-pas** was the first model of snow-shoes known to our aborigines. It is still used in cases of urgency, when better or more fashionable snow-shoes cannot conveniently be made or, under all circumstances, by poor or unskilled people. Nevertheless this form is now obsolete, and is generally laughed at by the possessors of more elegant implements. The ground stick of this snow-shoe is of one piece from fore-end to tail, and the whole is left flat, as is the case, I think, with most of the snow-shoes in use in Eastern Canada. Fig. 141 represents a *khé-la-pas*.

The finer netting or filling of every Carrier snow-shoe is of delicate cariboo skin lines, and the coarse or middle one is of moose rawhide line. As these implements are said to be adventitious here, I will refrain from going into the details of the netting process which our Indians are not likely to have materially altered since the introduction among them of these winter commodities. Suffice it to say that a whole independent filling in is made out of a continuous string. The ground or side sticks are generally made of young saplings of black spruce or of Douglas pine *(P. murrayana)*; but those of mountain maple *(Acer glabrum)* or of mountain ash *(Pyrus Americana)* are more esteemed, though heavier. In all cases the cross-sticks are, as a rule, either of willow or of birch.

In fig. 142 we have the most recent type of Carrier snow-shoe. It will be seen at a glance that it is not inelegant. It is the *ɲəʼɲu* or "stitched together" by allusion to the peculiar form of its head. To

* "Mocassin (or *chaussure*)-end-rounded;" by allusion to its form.

facilitate walking, this is curved up and so retained by means of two or three lines twisted in one solid cord. To add to the gracefulness of the fore-end and prevent it from shrinking in, an additional bar is inserted some distance therefrom, and the resulting tension is also corrected by a transversal cord binding fast the extremities of the two sticks. The ground netting passes under both bar and cord. The name of this variety of snow-shoes indicates that the side sticks were originally united at both ends by means of stitches of skin lines; but to-day small nails or screws are more commonly used. Little tufts of coloured yarn issuing from each side of the frame are intended to add to the elegance of the implement. Such ornaments at the hind part of the snow-shoes distinguish the women's from the men's snow-shoes.

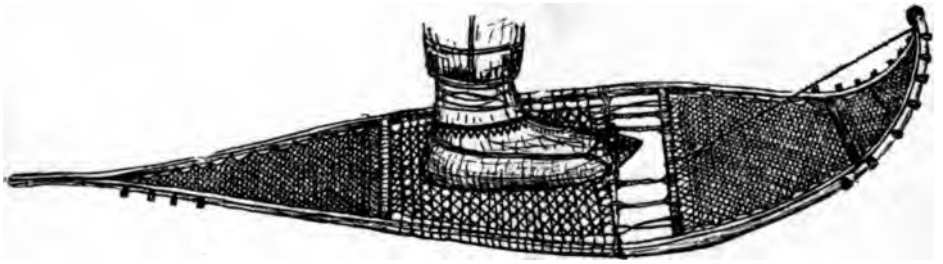


Fig. 142.

The artificial bending of the side sticks is obtained by two different methods. In the first case, such parts of the wood as are to be worked upon, are carefully wrapped with strips of willow bark and thoroughly heated by close application to the fire. They are next gradually pressed up with the hand or by forcing against the ground, when their ends are solidly tied so as to prevent the wood from returning to its original shape. However, this is more commonly steamed or rather "cooked" in boiling water, such parts of the sticks as cannot be introduced in the kettle or boiler being operated on by pouring thereon spoonfuls of hot water until they have become sufficiently pliable.

A third model of snow-shoes quite as common, if not more so, is the *·aih-za* ("snow-shoe only," or ordinary snow-shoe). In this, as in the preceding, two sticks are employed to form the frame, but instead of terminating in a sharp front end, their fore-ends are thinned and joined together with a strong lashing of rawhide lines thereby forming a rounded instead of an angular head. In other words, this snow-shoe is a long khé-la-pas made out of two side sticks and curved up in front as the ɬət'ɬu. Therefore the additional cross-stick and string noticed in the latter are wanting in this unpretentious style of snow-shoe.

The Tsé'kéhne snow-shoes are remarkable for the number of their cross-sticks. They generally have six of them, three in front, and three back of the middle or coarse netting. They thus gain in solidity what they lose in lightness.*

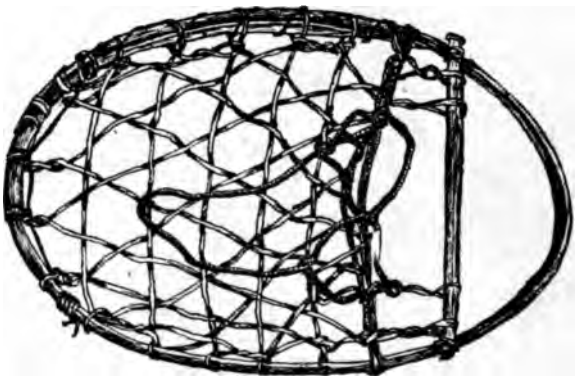


Fig. 143.

The last variety of Carrier snow-shoes is herewith figured. Its form will no doubt explain its native name, *sɔ̄s-khé*, "black bear foot." It is proper to little children before they are sufficiently grown up to use the common snow-shoes. Not unfrequently, women, especially those who are poorly circumstanced or unprepared for a heavy fall of snow, will be seen wearing similar, though of course much larger, snow-shoes. Naturally the frame of such primitive implements is composed of only one stick whose ends are rudely lashed together. Instead of having the cross-stick notched in as in the above figure, it is more generally forced in a shallow hole mortised at either side of the frame.

Fig. 144.

As these implements are essentially temporary, they are often of a rude description. Such is not the case with the *ɟɔt'ɟu* and the *·aih-za*. Not only are the wooden parts of these carefully shaved and scraped over, but they are generally daubed with red ochre, and in not a few cases covered with a coat of red or blue paint.

* The reason of this is their great length which is intended to deaden the creaking of the frozen snow caused by the short snow-shoe, and thereby not to betray the approach of the hunter.

Here we have the winter walking-stick * already alluded to. It renders to the hand of the traveller over snow fields the same service as the snow-shoe does his feet, since its circular appendage (fig. 144)

Fig. 145.

prevents the stick from sinking too much in deep snow. It has moreover another very valuable advantage which I have tried to illustrate through fig. 145. The hand of the hunter, warm and trembling from the excitement of the chase, if passed through the leather loop which often

Fig. 146.

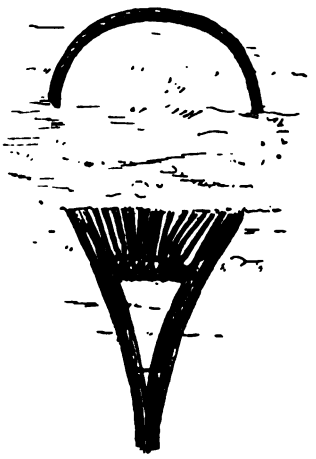


Fig. 147.

accompanies the upper part of the staff, can thereby be steadied and find a reliable support for the barrel of his gun while in the act of

* *Thɔz-mas*, "walking-stick rounded" by allusion to the circular appendage.

firing. Despite these undoubted advantages, this walking-stick tends to become obsolete in several localities.

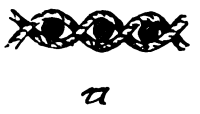
But one implement now remains on our list of undescribed wood-and-skin items. This is the ice-scoop or *ɂupas* of which an idea may be gathered from fig. 146. It is brought into requisition to scoop out of the hole one is making in the ice the broken pieces driven in with the *ɂté* or ice-breaker. The frame is usually of mountain maple. Fig. 147 will explain the connection between the strings and the frame.

TEXTILE AND TWINED FABRICS.

We now come to the twined and textile fabrics of the Western Dénés. The latter are very few ; indeed the weaving industry might almost be described as null among those tribes, since the rabbit skin blankets were originally the only genuine textile fabric manufactured among either the Carriers, the Tsé'kéhne or the Tsiɬkoh'tin.

The weaving of these could hardly be more primitive. The first step is of course to spin, or rather to twist on the naked thigh, the strips of the rabbit skins. These are previously steeped in water to facilitate the cutting and spinning operations. Each skin is made to yield one single band, and each band is knotted end to end so as to form a continuous cord.

A frame or loom is first erected with poles of the proper dimensions and secured either by planting the two side pieces in the ground, or, more commonly, by leaning them against each wall of any corner in the house. Over the two cloth-beams, the skin cord is wound so as to form the warp. As for the woof, a separate strip is knotted in its middle part to the last left hand thread of the warp in such a way that two threads result which are then twisted together, then entwined with the next warp thread, again twisted together, again entwined with the next perpendicular thread, and so on until the last thread of the warp is reached, when the operation is resumed from the right to the left. Each successive woof thread is added immediately under the preceding one so that the weaving, if weaving there be, is always in a downward direction. Whenever the web becomes too low for the convenience of the weaver, web and warp are made to revolve on the loom beams up to the suitable height. The web is then momentarily steadied by means of a string attached on either side to the perpendicular poles of the loom. No batten or any similar device is used. Fig. 148 will give some idea of the whole process. The cut *a* represents a cross-section of the web.



a

The Tsi|Koh'tin and Carrier women now weave fairly good belts or girths out of the yarn they get at their trading posts. But this is a new industry among them and we need not tarry in its description. Suffice it to say that they use wooden healds as those of the Zuni Indians. Indeed, I think that the whole method of girth weaving is practically identical with these two heterogeneous stocks.

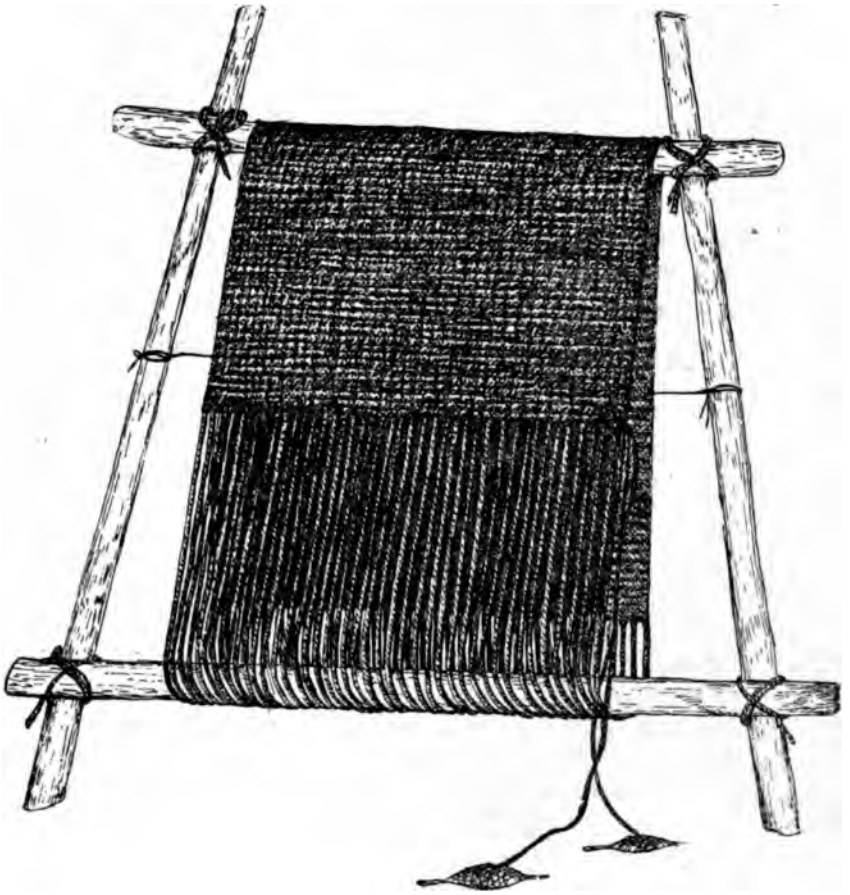


Fig. 148.

The Tsi|Koh'tin women also weave or plait mats commonly used to spread on the floor or ground instead of a table cloth, the *menu* of the family repast round which each person squats while partaking thereof. The material is a sort of rush or juncaceous plant, the exact species of which I could not determine. Matting is an unknown industry among the Carriers and the Tsé'kéhne.

With regard to the mode of netting, the drag-nets of the Western Dénés are of two kinds: one is intended for service against any species of fish, with the exception of the sturgeon, and the other is of use to capture the latter fish exclusively. Fig. 149 will explain the manner of

Fig. 149.

Fig. 150.

knotting the sturgeon net, while all the other kinds of netting, whether drag, scoop, or dip-nets, or even, the packing bags which shall soon be described, are knotted, as shown in fig. 150.

No mesh-stick is used while the Carrier is working at the smaller varieties of nets. It is replaced by the middle finger of the left hand. In this case, the netting-needle also consists merely in a narrow piece of board scalloped at either end to receive the twine which is wound around. But when at work upon large-meshed nets, our aborigines have recourse to the picture frame-like wooden implement herewith figured. This is

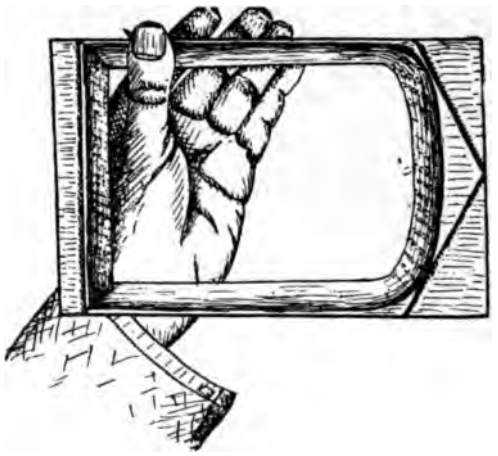


Fig. 151. ⅓ size.

carved out of one piece and serves as a mesh-stick. It has replaced the original wooden horse-shoe made of a bent twig. In this case a regular netting shuttle is also resorted to. As this is in every particular identical with that common among white fishermen, it is but natural to infer that it is here a borrowed article.

The meshes of the sturgeon net are about ten inches square, while those of the beaver nets are based on the distance between the tip of the thumb and that of the index finger when both are outstretched. The width of any kind of fish-net of the larger variety corresponds with that of seventeen meshes of the same net. The nets intended for smaller fish have their meshes from ¾ of an inch to one inch and a half square. About twenty of the former dimensions form the width of the net. All kinds of drag-nets measure at least one hundred feet in length.

Among the Tsé'kéhne both hands outstretched with the thumbs tip to tip are the standard measure for the width of the beaver net. Large nets require twelve such units, while the smaller ones have only nine, or thereabouts. Such nets never exceed twenty-five feet in length.

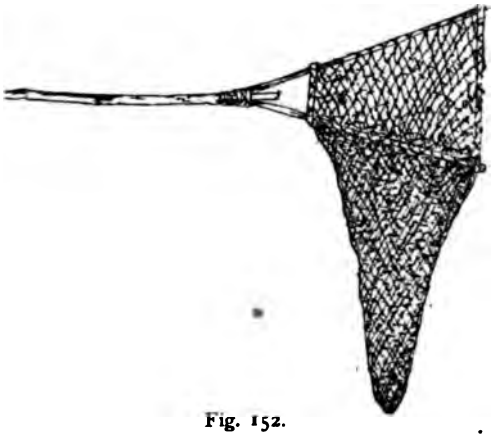


Fig. 152.

Identical in netting are the two kinds of dip-nets * in use among the Carriers. The first (fig. 152) serves either to catch salmon or to scoop out the smaller fish which periodically swarm up certain shallow streams. When doing service against salmon, it is dipped in the water and then left until a capture is effected. But if used to catch small fish, it is managed as a ladle. Its make will be easily understood by a glance at the above figure. It is from five to six feet deep.

Fig. 153 represents a smaller variety of the dip-net. It serves in a few places only, and, as a rule, its period of usefulness does not exceed four or five days in one year. During the first warm days of each recurring spring, immense numbers of the *thé'mək*, the very small fish which we have already mentioned in another chapter, ascend to the surface of the water in a few lakes and become an easy prey to the Indian women who, armed with this net, scoop out canoe loads of it in

* *Pe'-thəʁaih*, "wherewith one scoops," a verbal noun.

one single day. Less than a week thereafter, not a fish will be seen of the myriads that were basking in the sun. Of course, the meshes

Fig. 153.

of the dip-net resorted to as a means of securing them are proportionally small. They are scarcely a quarter of an inch square.

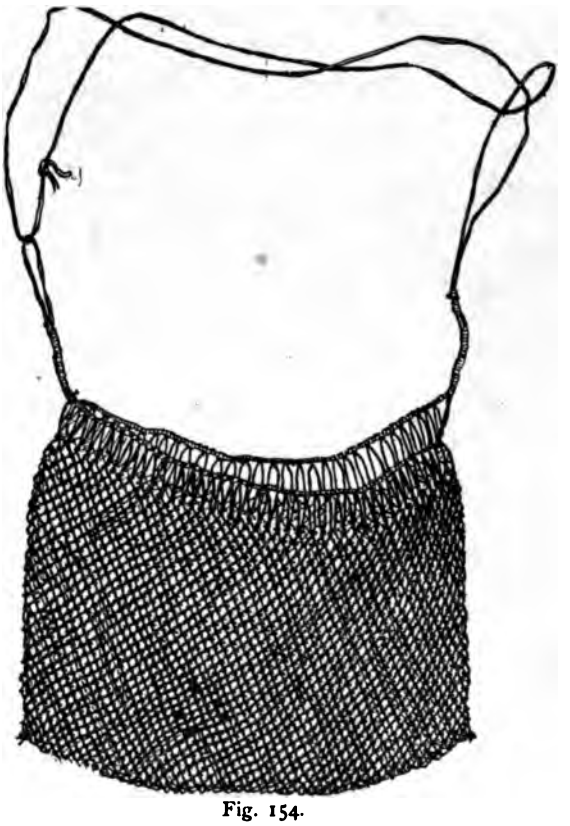


Fig. 154.

The nets of our aborigines were originally of the fibre of either the nettle (*Urtica Lyallii*), the willow (*Salix longifolia*) bark, or a species of

wild hemp called *hwonɔɭa* in Carrier. The plants were carefully dried in the house, crushed with the hands, and their fibres extracted by pulling up with the right from the left hand, pressing the stalks down on the ground. The shreds were then spun by twisting on the thigh. Naturally this was the work of the women. Nowadays fine Holland twine is used instead.

Though the skin of the beaver is occasionally used to make beaver-nets —as is the case when the animal is found so decomposed that its fur has lost its value—yet such nets are generally of cariboo skin cut in fine strips called "babiche" in the parlance of such Indians as parade an acquaintance with the dialect of the H. B. Co's. employees.

Such is also the material of the *t'ɭuɭ-ɔn'kez'*,* or packing bag of fig. 154. This is to the men what the moose skin wallet (fig. 135) is to the women. It serves to carry to short distances light burdens such as a lunch, peltries to the trading post, provisions for an unimportant journey, etc. It is also very commonly used as a game-bag. The above figure represents the t'ɭuɭ-ɔn'kez' such as is still made among the Tsé'kéhne, and as it was originally among the Carriers. But of late years the latter, having learned from their missionaries to have a greater regard for the physical weakness of the gentler sex and to do themselves at least a part of the packing, use it for heavier burdens than those for which it was originally intended. This has rendered the rounded cord through which it is carried uncomfortable. It is now replaced by a regular leather thong, which also runs round the rim of the bag.

* T'*ɭuɭ* means "rope," and the desinence of the compound word *'kez*, which implies "direction, tendency" towards a place, is common to all packing devices.

CHAPTER X.

DRESS AND PERSONAL ADORNMENT.

COMMON DRESS.

It would be difficult at the present time to reconstruct in all its details the national dress of the prehistoric Western Dénés, if indeed there ever existed any national or uniform costume for each and all of the different tribes and sub-tribes under study. Sir A. Mackenzie, in his account of the voyage of discovery he made in 1793 through part of their territory, might perhaps enlighten on this subject the reader who can have access to his narrative.* Not enjoying this advantage, I must content myself with what I have learnt from daily intercourse with the most reliable among the older Carriers.

Speaking of the dress of the Eastern Dénés, the Rev. E. Petitot has the following to say :—

"Outre la blouse de peau blanche à queues décorées de franges et de breloques metalliques, qui fut le costume primitif des Déné-Dindjié et que portent encore les Loucheux, ceux-ci, ainsi que les Peaux-de-Liévre y joignent un pantalon de même matière et aussi richement orné, qui est cousu avec la chaussure. Il est porté par les femmes comme par les hommes. Les tribus plus méridionales remplacent le pantalon par les cuissards ou mitasses que des jarretières retiennent aux jambes, et par un pagne oblong d'une étoffe quelconque.

"La robe des femmes est trés courte et orneé d'une profusion de franges, de houppes de laine, de verroteriès et de breloques sonores. La chaussure générale est le mocassin, ou soulier de peau molle qui emprisonne et dessine le pied comme un gant le fait de la main. Durant l'hiver le renne, le castor et le liévre arctique sont mis à contribution pour fournir à l'habitant du désert des vêtements aussi chauds que légers et commodes.†

That the dress of the Western Dénés considerably differed from that of their Eastern congeners such as above described is beyond the possibility of a doubt. And no wonder. Being of an imitative turn of

* Voyages from Montreal, on the river St. Lawrence, through the continent of North America, to the Frozen and Pacific oceans; in the years 1789 and 1793, etc., London, 1801.

† Monographie des Déné-Dindjié, p. xxiv; Paris, 1876.

mind, and living, most of them, in close proximity and with frequent intercourse with the Coast Indians on the one hand and the Shushwap on the other, they could not fail to accommodate themselves to their environments. It may be taken for certain that their wearing apparel was, as a whole, rather meagre and scanty. This remark does not apply to the ceremonial costume of the Carriers, which, as will soon be seen, was quite elaborate and complicated.

'The summer dress of the men consisted mainly, if not entirely, of a tunic, the breech piece, the leggings and the mocassins. The tunic was a loose vestment which the Indians now compare to a shirt. Its material was tanned cariboo skin, and it descended to the thigh or thereabouts. It had no tail-like appendage as that of the Eastern Dénés. This tunic was uniform neither in cut, nor in material, as poor people made it of almost any available skin with the fur on, and gave it the form best suited to their means. Well-to-do Carriers decorated this garment with a multitude of fringes to conceal the seams. The strands of these were sometimes further embellished by means of porcupine quills dyed yellow or green.

The breech-piece and the leggings were also of the same material, cariboo skin. The latter covered the legs in their whole length, and were kept in position by a string tied to the leather belt on each opposite side. They were furthermore secured below the knee by means of ornamented garters (see fig. 145). These breech cloth and leggings without trousers were still worn here by a few men not more than twelve years ago. Leggings of identical style are still in common use among the men, but during the winter months only, and they are now worn over the pants.

The national foot gear is, and has always been, the mocassin. This was originally of the dressed skin of the elk *(Cervus Canadensis)*. But the poorer classes frequently made it of untanned marmot skin, or even of the skin of the salmon. The mocassins are now uniformly of dressed cariboo or moose skin among the Carriers and Tsé'kéhne and of deer skin among the TsilKoh'tin. An idea of their present form may be gathered from fig. 142.

Owing to the nature of the material of these mocassins, our aborigines generally went barefooted in rainy weather, and to-day the women and the children at least still adhere to this custom. It must be added that, progressive as the Carriers are, there is not among them a single man who would undertake a journey of any importance, nay even a short trip, without the traditional mocassins. Even the most advanced young men profess to be unable to walk any considerable distance with our common leather shoes.

All the Western Dénés wear mittens, which are made of the same material as their mocassins. Even during the fair season, they will never do any kind of manual work without having them on. They are suspended to a cord of plaited yarn passing behind the neck and over the shoulders, so that, even when they are not in actual use, there is very little risk of losing them. The wrist-band is invariably ornamented with stripes of blue and red cloth, together with colored ribbons, according to the fancy of the wearer.

Gloves are now used, but were unknown in prehistoric times.

Instead of the hood common among their kinsmen of the Mackenzie Basin, the Carriers formerly wore a dainty cap of marmot skin made in this wise:—A band, some three inches broad, was cut from the skin with the hair on and secured at either end so as to form a crown-like head-dress. Over this was sewed a circular piece of similar material leaving out a brim of the same width as that of the band. This projecting part of the skin was then slit into a fringe which rested gracefully on the original head-band.

This description applies to the summer cap. The winter head-gear consisted of a hemispherical bowl of woven rabbit skin strips without fringes. Both summer and winter, men and women wore the same style of cap.

The summer dress of the women did not materially differ from that of the men. The tunic was simply longer and oftentimes ornamented round the shoulders and back with a row of pendent cariboo and beaver claws or teeth. For the sake of convenience a girdle also secured the folds of that robe over the waist. They wore, and among the Carriers continue to wear, leggings like the men.

During the cold season both sexes, but more especially the women on account of the outdoor work to which they were subjected, added to the foregoing a sort of small blanket of undressed skin of any small fur-bearing animal which covered their breast from the neck to the waist. This pectoral blanket was attached with strings behind the neck and also secured by the outer girdle round the waist. We have already seen that in olden times a swan's skin sometimes served an identical purpose.

The body was further protected against the inclemency of the season by means of a large cloak of lynx skins sewed together and worn with the hair outside. The more conservative half of the Tsi|Koh'tin tribe have retained to this day the use of this fur cloak. But it is worn among them with the hair next to the body, and the material is, as with the poorer Carriers, marmot instead of lynx skins. The Tsi|Koh'tin women

transform it into a sort of gown by tying it round the waist with a girdle of leather, from which hang beaver nails or teeth, old thimbles or shells of exploded brass cartridges which produce during their walk a jingling sound much appreciated by the native ear.

Winter and summer, the members of the three tribes under consideration wrap their feet with square pieces of blanket, *khé-thəl** which are to them the counterpart of our stockings.

With the advent of the whites the dress of the Western Dénés gradually changed, until it became, what it is now, practically that of the H. B. Co.'s people, with the few additions necessitated by the nature of the former's avocation. However, skin coats identical with that illustrated through fig. .145 are still occasionally met with, especially among the Tsé'kéhne and Babine tribes.

The foregoing remarks, as I believe, will give a fair idea of the aboriginal costume such as it obtained among the Western Dénés, without reference to rank or age. But, when treating of the natives' wearing apparel, one should not forget that even their psychological ideas are not without influence on its nature. We should remember that most dreaded creature, the pubescent girl. She was considered among the Carriers so much of an *être à part*, that she must constantly wear some badge to remind people of her terrible infirmity, and thereby guard them against the baleful influences which she was believed to possess. This consisted in "a sort of head-dress combining in itself the purposes of a veil, a bonnet and a mantlet. It was made of tanned skin, its forepart was shaped like a long fringe, completely hiding from view the face and breasts; then it formed on the head a close fitting cap or bonnet, and finally fell in a broad band almost to the heels. This head-dress was made and publicly placed on her head by a paternal aunt, who received at once some present from the girl's father. When, three or four years later, the period sequestration ceased, only this same aunt had the right to take off her niece's ceremonial head-dress."†

The latter sentence applies to the daughter of untitled parents. In case the maiden was of noble birth, the first anniversary of her entering

---

* "Foot-platform." The native names of the different parts of the wearing apparel are herewith given, as they may afford a clue, when considered from an etymological standpoint, to the relative degree of importance or antiquity of the articles thereby denominated. Head-gear of any description, *t'səR*; coat or tunic, *tzût*; breech-piece, *tsan*; girdle, *sé*; cloak (and blanket), *tsət*; leggings, *khé-tsih* (wherein-the-foot-is-passed); mocassin, *khé-skwət*, or in composition *khé* (synonymous with "foot"); pectoral blanket, *pətsúchuz* (that—being a soft stuff—which covers), a verbal noun.

† The Western Dénés; Proc. Can. Inst., 1888-89, p. 162.

upon her maturity witnessed the imposition, with befitting ceremonies and the usual banquet, of a sort of diadem such as herewith figured.

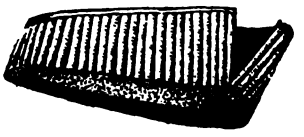


Fig. 155.

The ground part of this was a band of tanned skin which was fringed from about one inch and a half above the bottom up to the top. Each strand of that fringe was passed through a dentalium shell and then sewed up at the top to an encircling strip of skin. As this crown was lower on the back than in front, shells of different lengths were chosen according to the place they were to occupy, A lining of skin, with or without the fur on, was then added, and the lower corners of the ends stitched together, as shown in the cut. Upon crowning the maiden with this shell diadem, the paternal aunt became heir to the discarded bonnet with fringe and mantlet.

Both diadem and bonnet were articles of every day wear, and genuine ceremonial head-dresses.

Not only pubescent girls, but even such boys as were reaching the same stage of life had their fingers, wrists and legs encircled with rings or bracelets made of sinew entwined with down. Neglecting these precautions would have exposed the careless party to premature infirmities and incapacitated the young man for the fatiguing exercise of the chase.

The Western Dénés of the old stock, and especially the Carriers and the Babines, were not wanting in articles of personal adornment. Among head ornaments, they had the ear-pendants, the nose ring or crescent, the *ni-*Kə*-dîn'a*, the hair pendant and, among the Babines, the labret.

Two very distinct varieties of ear-pendants * obtained among the Carriers. The first consisted in a bunch of four buckskin strings passed through pairs of dentalium shells and hanging from the ear, as shown in fig. 156. As soon as glass beads became known, some were inserted between each of the two shells suspended from each hole in the ear. A small beaver claw furthermore prevented the pendent shells and bead from slipping off. Several Indians still bear the marks of this now antiquated pendant.

A different kind, which was still in honour but a few years ago, but is now likewise obsolete, is the haliotis pendant (fig. 157). The specimen from which I have drawn fig. 157 was in actual use when obtained for my collection. Pendants of this material probably affected various forms. Yet I fear that no other specimen could now be found among our

* *Tzokwol.* 2nd. cat.

aborigines. Considering that fine shreds of sinew were formerly, as they are to-day, common in every native household, it would appear, judging by the coarse line of buck skin appended to this "jewel" that very little regard was entertained in olden times for the sensibility of the human ear.

Fig. 156.

Fig. 157.

The dentalium pendant was proper to men, while the latter or haliotis ornament belonged to the fair sex. With insignificant exceptions, neither the men nor the women now wear any ear pendant or ring, except among the Babines, whose *təneza'* or noblemen have adopted the silver ear-ring,* proper to persons of similar rank among their alien neighbours, the Kitiksons.

As among the majority of savage or barbarous peoples, in contradistinction with civilized nations, the Western Dénés were formerly fond of perforating their septum to introduce therein what they considered wondrous ornaments. These might be divided into three different categories: the crescent, the discoidal or cruciform pendant and the silver ring.†

The two first ornaments are figured above, and were of haliotis shell. The crescent was, of course, inserted to the middle through the hole of

* See Niblack's The Indians of the Northwest Coast, plate vi. fig. 13.

† All the nose-pendants are called *ni-spas*, *ni*, a contraction of *nih*, "nostrils;" *spas*, the root of *nanispas*, "ring-like."

the septum, the cusps hanging down. Others were contracted enough to permit of being worn ring fashion with the cusps grasping the septum as those of the ancient Peruvians.* I have seen Babine women wearing through the septum a silver crescent of identical size with that figured above.

Fig. 158.

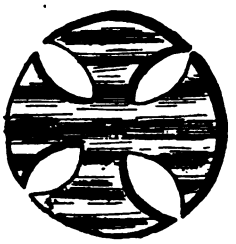


Fig. 159.

The circular nose-pendant (fig. 159) was placed in position by pressing the fore part of the septum through the cusps formed by the deep indentations carved out in the shell until the septum hole was reached. The proximity of the points or cusps then prevented its falling off.

As for the third variety of nose ornaments, it consisted in a silver ring which was more than once of ridiculously generous proportions. Indeed, if I am to credit my informants, this was, among the Babines, of such a size that one could easily eat through it. I have never seen any.

All the above nose ornaments were used indifferently by men or by women. A fourth, which it was the privilege of the women of rank to wear was the *ni-kɔ-dîn'a*, or "passed through the septum." Fig. 160 will

Fig. 160.

explain its form, without doing justice to the material of which it was composed. Two pairs of dentalium shells, the small end of the one

*See "A Study of the Textile Art," by W. H. Holmes, vi. Ann. Rep. Bur. Ethnol., Washington, 1888, p. 237, fig. 343.

inserted in the large end of the other, were kept springing out, as it were, from the septum by means of a sinew thread running from end to end of the shells and through the perforated nasal partition. The extremities of the "ornament" were adorned by a small tuft of the red down of the head of the wood-pecker *(Ceophleus pileatus)*. This ornament was rarely exhibited outside of ceremonial gatherings.

It can already be inferred from the foregoing that the Western Dénés prized as much the dentalium *(D. Indianorum)* shells as their kinsmen who now inhabit the Hupa valley, in California. That the esteem of the former for the red scalp of the wood-pecker is not confined to them may be gathered from a perusal of Prof. O. T. Mason's "The Ray Collection from Hupa Reservation."*

Fig. 161.

Lastly, with a view to enhance their natural attractiveness by means of extrinsical ornaments, the young men and young women attached on either side of their hair, a little above the ears, bunches of strings decorated with dyed porcupine quills and beaver claws† or, more recently, holding glass beads of various colours sometimes ending in copper buttons, as is the case with fig. 161. Until a few years ago, these

* P. 231.

† *Nimpa-stla*, "they lie on the face-edge," a verbal noun.

were to be seen occasionally in a few remote places. As all other articles of native adornment, they have now completely disappeared.

In the course of his paper "On the Masks, Labrets," etc., W. H. Dall gives the following definition of the labret. "The labret, among American aborigines, is well known to be a plug, stud, or variously-shaped button, made from various materials, which is inserted at or about the age of puberty through a hole or holes pierced in the thinner portions of the face about the mouth. Usually after the first operation has been performed, and the original slender pin inserted, the latter is replaced from time to time by a larger one, and the perforation thus mechanically stretched, and in course of time permanently enlarged."* As regards the nature, mode and time of insertion, these words are in every way applicable to the labrets† of the Babine sub-tribe. When these had reached the maximum size which they were to retain for life, they were a flat button, oval in circumference, at least one and a quarter inch long by three-quarters inch wide, of a hard wood, commonly mountain maple *(Acer glabrum)*. The insertion of the tentative bone pin was the occasion of special rejoicing and feasting. The women only were entitled to this piece of ornamentation, and, as a rule, the higher the rank of the wearer the larger the labret was to be.

So much for the head ornaments. Other pieces of aboriginal jewelry of every-day wear were the *tsi-neɟthan*, the *tsi-nezdîlya* and, in later years, the *na-ɟthan* and the *la-tcən*. With the exception of the last, which is a compound noun of the third category, all these words are verbal nouns descriptive of the trinket thereby differentiated.

The two first mentioned were the Déné necklaces. The *tsineɟthan* was obtained by boiling and splitting off a thin band of a cariboo horn, which was given, while still pliable, the desired form. As an attempt at ornamentation, geometrical designs were scratched with the stone knife, over which a pinch of diluted red ochre was rubbed with the hand. The colouring matter passed over the smooth surface of the horn, but remained in the light furrowings which were thus brought into greater prominence. This primitive method is still common among the Western Dénés. Charcoal, instead of vermilion, is sometimes used.

The *tsinezdîlya*,‡ was a necklace of dentalium shells which was liable to affect different forms, as the shells were threaded in such a way as to fall over the neck or to encircle it lengthwise. A similar necklace,

* Third Ann. Rep. Bureau of Ethnology, 1884, p. 76.

† "*Ni-ta-'kéz*, man (*i.e.* human)-lip-over."

‡ "That (a composite object) which is put around the head," *i.e.* the neck.

but larger and worn resting over the shoulders and breast, was a badge of the possession of shamanistic powers on the part of the wearer.

The *tsineǰthan* was of so primitive material that its adoption as a means of personal adornment must have been rather early. Though the material of the tsinezdilya was an imported article, this necklace could, according to the following Carrier narrative, boast of an at least as great antiquity, unless we assign a recent origin to the actual plumage of the loon.*

"Once upon a time, there was an old man who was blind. He had a wife who used to help him in this way to keep alive: whenever she sighted game, she would hand him his arrow to moisten the stone point thereof with his saliva—for this old man was possessed of magic powers. Then pointing the arrow in the direction of the game, she would let him release it himself, which he usually did with good effect. One day, both came upon a very fat cariboo—"Moisten the arrow-head with your saliva," said the woman to her husband, which after he had done, he shot dead the animal. But his wife, who coveted the fat of the cariboo and was tired of living with a blind old man, pushed him aside, thereby throwing him to the ground, saying: "That old fellow,† what a bad shot he is!" —'But I think I have killed it,' insisted the old man. Yet as he was blind, he could not get the game, and while searching for it, he strayed a long distance from his wife who now abandoned him.

"As soon as the old man was out of sight, she set to cut up the animal, helping herself at the same time to large fried slices of its meat. What she did not eat on the spot she cut into thin pieces and hung out to dry.

"Meanwhile the old man was bewailing his fate. In the course of his aimless wanderings he had reached the shore of a lake, when a loon, hearing his cries swam towards him as his kins are wont to do even now whenever they hear anybody talking in the forest.—"What ails you"? he said to the man.—'Poor wretch that I am, my wife has left me, and I am blind,' answered the latter.—'I will cure you,' said the loon; 'come over to me and hide your eyes in the down of the back of my neck. The old man did as he was bid, and both the loon and himself plunged in the water. When they reappeared on the surface, they found themselves at the opposite end of the lake.—'Now can you see'? quivered the loon. 'Look at yonder mountain,' he added. The old man complied with the request and answered: 'I see a little, as if through a mist. Repeat the

* This tale is also current among the Tsi|Koh'tin.

† *Tɔnethi-'qɔl.* The desinence of this word is expressive of spite and scorn.

operation.' Again did the loon dive with him, emerging this time at the original point of departure. 'Now can you see'? asked the loon.—'I now see very well,' replied the old man wading ashore. Then to show his gratitude to his benefactor he presented him with his own dentalium shell necklace, and taking some more dentalium shells from his quiver, he threw them * at him.

"Ever since, the loon wears a white necklace, and the shells which hit him also produced the white spots we now see on his wings.†"

Now that we are satisfied as to the great antiquity of the dentalium necklace, we will leave the old man of the story to settle with his unfaithful spouse, and return to the description of the other articles of adornment obtaining among the Western Dénés.

The *na-ɣthan*‡ is the horn or metal wristlet which has already been described and figured (see fig. 126).

Fig. 162.

As for the *la-tcən*‖ it is of modern origin, and is an imitation of the ruffles of the whites. As such, it is worn in winter time as a protection against cold. But many Carrier or Tsé'kéhne girls nowadays wear a variety of it merely as an ornamental addition to their costume. To that class belongs the *la-tcən* herewith figured. It is of glass beads of several colours mounted on sinew threads. The rosette in front is made of narrow ribbons and a common mother-of-pearl button.

CEREMONIAL COSTUME.

It has already been hinted that the ceremonial costume of the Carriers, was very elaborate. When one keeps in mind their proximity to the coast Indians who are so fond of parade and display, this statement cannot surprise. What would rather astonish those who have read a former paper by the writer wherein the wonderful faculty of imitation characteristic of the Carriers is chiefly brought into relief is the fact that though the sociological peculiarities which gave rise to this costume were evidently borrowed, yet the latter was, in the main, original. It was proper to the *təneza·* and the *t'sèkluza·* or noble men and women.

* "Threw them" and "presented them" are rendered by the same word in Déné.

† The loon of this story is the *Urinator pacificus* of the naturalists.

‡ "That (being of a naturally long material) which is around."

‖ Lit. "hands-stick," same word as that for "wrist."

Ceremonial banquetting, distribution of clothes or victuals, dances, incineration of the dead, etc., were the most common pretexts for its exhibition.

It will be noticed that the nature of its adorning material was rather monotonous and little varied. This consisted principally in the dentalium shells* interspersed with beaver claws and cariboo hoofs, pelts of small animals, the feathers and down of a few species of birds and porcupine quills.

The latter were invariably dyed, and here it may be explained that the Carriers, at least, knew but two varieties of dyes: yellow and green. The yellow colour was obtained by boiling the quills with a species of hair-like lichen apparently akin to the *Alectoria jubata*, but botanically different (*Evernia vulpina*). The green dye was no other than the decayed wood found almost everywhere in the forest. The colouring matter was likewise extracted by boiling. An analogous method is now followed, to dye in red or blue the plumes with which the young men are fond of ornamenting their hats and the horse hair which serves to embellish the instep piece of their mocassins: the original dye of the cloth or stuff procured at the trading posts is simply extracted and transferred by boiling.

The distinctive pieces of the noble man or woman's ceremonial attire were: the wig, the coronet or *'tasťɲu*, the breast-plate or *yostəthəɁ*, and the *Raz*. With the exception of the third, of which I know but one specimen, none of them can now be seen outside of my collection. Each one was formerly so prized that it was the appanage of the full fledged təneza· only. All the other parts of the costume, such as the leggings and the mocassins, were of course proportionately rich and ornamented.

I possess two specimens of the ceremonial wig or *tsi-'kə-stzai*† and both differ in make and style of ornamentation. Fig. 163 represents what is perhaps the most elaborate in design. As no cut can do full justice to its details, I may be pardoned the following description. It is composed of three distinct parts: the horn-like appendage, the cap or head covering proper and the pendent train. The horns are made of the stout bristles of the sea-lion's whiskers, two lengths of which are used and united in front by means of buckskin and sinew threads. A rough network of the latter material fills up the space between the horn and the cap, and is arranged so as to determine the concavity of the latter.

* *ʒpai* in Carrier, *tɟəpai* in TsilKoh'tin.

† Lit. "head-on (minute objects—*i.e.* the shells) are-lying."

Fig. 163.

The cap is formed of two rows of dentalium shells attached to a strip of cariboo skin otherwise secured to the above mentioned netting. A narrow band of leather separates the two rows and serves to retain in juxtaposition the shells whose threads are also passed through it at the proper intervals. The train is of human hair and measures three feet in length. Each strand is formed of about a dozen hairs twisted into a two-ply cord. About one foot from the bottom, bunches of perhaps fifty hairs in their natural condition are added to the end of each strand by means of finely shredded sinew. Moreover, on the outside of the upper part of the train, and forming continuation with the two rows of dentalia of the cap are bunches of four shells of the same description from the united small ends of which hang flaps of artificially curled human hair which add not a little to the general effect of the whole. Altogether, this wig must have produced a striking effect.

The second (fig. 164) is of less complicated design, but of perhaps more costly material. The front horn-like appendage is replaced by fine strips of ermine skin, and the head-covering part is likewise of dentalium shells, of which there are three rows. These are gathered in bunches of three, which are tied at the small end over heavy three-ply cords of human hair terminating on the outside in flaps of curled hair, as in the previous case. The train is composed of fine three-ply strands of human hair adorned, every three inches or so, with two dentalium shells in successive order. To retain these at the proper intervals, little pieces of wood are inserted between the shell and the strand, or the latter is wrapped over with sinew thread. This train is not so abundant in strands, nor quite so long as that of the preceding wig.

These wigs were used in festal dances during which they were decked with swan's down which, owing to the movements of the dancer, produced white undulating clouds intended to add to the picturesqueness of the scene.

They were held in such high estimation, that no consideration whatever could have induced their owner to part with them. The reason of this will be readily understood when it is known that they formed an integral part of the hereditary title of the nobleman. This is so true that they shared with him the traditional name which they were intended to honour. Thus wig, fig. 163, is called K*ahul* after its last possessor, who had himself inherited this name from a long line of ancestors. Therefore parting with them was equivalent to forfeiting one's rank and title. They were handed down from generation to generation, and this explains the air of antiquity and quasi dilapidated condition of those in my possession.

Fig. 164,

The staple material was the hair of notable women. It was clipped after death only, and arranged into the desired style on the occasion of the grand final banquet commemorative of their death and cremation. The hair of two women was required to make one wig.

Even women could aspire to the rank of noble or *t'sèkhèza'*, among the Carriers. On the occasion of ceremonial dances they wore a head-dress even more graceful and pretty in form, if not so imposing and weird in material. This was called *'tast'ɲu* or "woven-feathers." It was crown-shaped, and its principal component parts were stiff laps of fur skin, generally of the weasel, and feathers. The specimen herewith figured may be described as follows :—A strip of tanned skin about one inch in width and overlaid with three rows of dentalia serves as the foundation or head band of the crown. From this rise broad weasel skin strips with edges folded lengthwise and sewed up inside. These are stiffened by means of large feather quills or slender pieces of wood inserted therein. To further enhance the gracefulness of the head-dress, each skin is kept folded down at the top, thereby converting its tail into a flap. The skin laps are again retained in their upright position by a strip of dressed skin running, on the inside, around the upper periphery of the crown. Scalps of the red-headed woodpecker *(Ceophleus pileatus)* are secured on the folded part of each lap, while the tail feathers of another variety of woodpecker *(Sphyrapicus varius)* are sewn, pointing upwards, on the bottom and the middle of each upright piece of fur skin.

Fig. 165.

Fig. 166.

This head-dress was filled up, when in use, with down, which the wearer caused to escape around through the jerking of the head peculiar to the feminine style of dancing.

The above had been written and fig. 165 drawn for some time when I received specimen pages of a most important Bible Dictionary* now in course of publication in France under the supervision of that learned orientalist, the Abbé Vigouroux, wherein I found the sketch of a Chaldæan king

* *Dictionnaire de la Bible, etc., par F. Vigouroux*, Letouzey et Anè, Paris.

(fig. 166) wearing a headdress so much resembling the 'tast'ɭu that I could not resist the temptation of reproducing it here with the author's permission. This illustration being copied from a contemporaneous monument, offers a very suggestive base of comparison with the ceremonial paraphernalia of our aborigines. Though the crown therein represented must have been of some precious metal, it would seem that the feathers or *'ta* which have given its name to its American counterpart occupy an even more prominent place therein than in the Déné 'tast'ɭu.

The next important piece of the nobleman's ceremonial costume was the *yo-stathaɭ** or dentalium breast-plate (fig. 167). It had the form of a

Fig. 167. ½ size.

rounded crescent, and this particularity, no less than the costliness of the material, was no doubt intended to indicate the dignity of the wearer. The fitness of the dentalium as a means of ornamentation receives through this breast-plate its best illustration. These shells, as is well known, are larger at one end than at the other, and moreover are also slightly arched. The former peculiarity causes of itself the curve of the two broader rows of dentalia, while the latter likewise renders those of the middle and of the rim well adapted to the shape of the plate. The whole is of course mounted on a ground of dressed cariboo skin. Its two cusp-like extremities were clasped or knotted with rawhide strings behind the neck.

This article of personal adornment was valued at four dressed moose skins or forty beaver skins, which, if estimated at their present price, would represent the sum of $200.

* "Disposed downwards and in parallel order," a verb. noun.

Such was also the commercial valuation of the Raz. This is the ceremonial robe which I have elsewhere compared to the *mehil* of the Jewish high priest. It was originally of tanned cariboo skin, but the specimen in my possession (fig. 168) is of an old-fashioned printed stuff. Yet the fact of its main fringe being ornamented with porcupine quills and here and there with hoofs of yearling cariboo is evidence of respectable antiquity, considering the progressive tendency of the race to which belonged its maker. Exclusive of the lower fringe it measures 2 feet 2½ inches in length, and in its narrowest breadth it is 3 feet 4½ inches. The upper fringe is of red yarn, while that at the edge of the garment

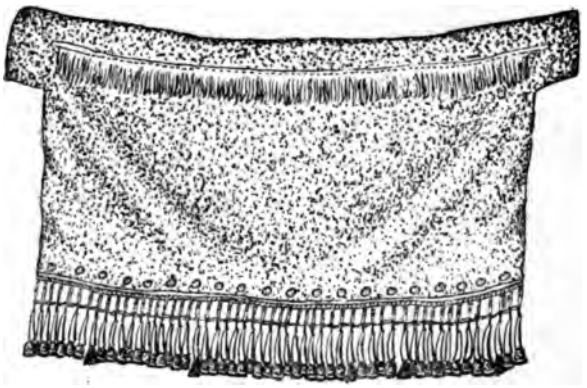


Fig. 168.

Fig. 169.

(fig. 169) is composed as follows:—Firstly, small rounds of red cloth sewn on the printed calico, then two fillets respectively blue and red running along the edge. A narrow strip of tanned skin is then sewed on, from which hangs the fringe proper. The upper part of the strands is wrapped with yellow or green porcupine quills, below which they are left naked until they are connected together at hanging intervals by a slender cord of sinew thread. After an equal length left uncovered, each strand is passed through a dentalium shell, ending in a sewing thimble or a cariboo hoof scalloped at the edge.

The lapels or side extensions at the top of the Raz are intended to button or attach it behind with strings; for though the garment resembled a robe while in actual use, it was put on and worn as an apron from the waist down. Needless to add that the metallic ornaments of

the lower fringe were well calculated to impress the bystanders by the jingling sound they yielded with the importance of the dancer.

The noblewomen wore no ʁaz, but substituted therefor the cincture-like piece of apparel shown in fig. 170. Though it resembles a girdle, it was considered a breech-cloth. Of course, being merely ornamental, it was worn over the dress. It will be seen that it was almost entirely of dentalium shells without any leather lining.

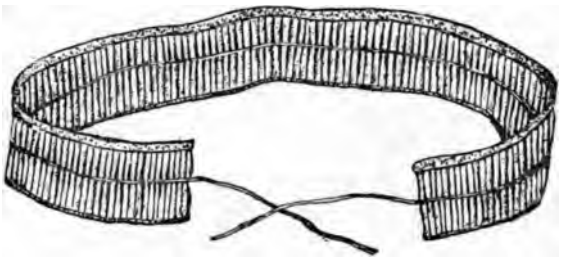


Fig. 170. ¼ size.

Fig. 171.

As a complement to his costume, the təneza· had his ceremonial *Kwənzəs* or fire-bag and ornamented quiver. I have never seen any specimen of the latter; but from what we know of the other pieces of festal attire, we may well imagine it glowing as the rest with the ubiquitous dentalium shells and fringes The fire-bag shown above (fig. 171) is mainly of cariboo skin with glass beads stitched on the edges and red and blue trimmings. It belonged to the original possessor of the ʁaz already described and is therefore contemporaneous therewith. This old man died five or six years ago at the age of 105 years or thereabouts.

The mocassins and leggings were also similarly ornamented on festival occasions. Truly, the Carrier "nobleman," standing in the midst of an admiring assemblage, crowned with the weird head-dress of his ancestors, resplendent in the glory of his moon-like breast-plate, clothed in the folds of his sonorously fringed robe, with his shining fire-bag hanging on the left and his jewelled quiver on the right, and bedecked from head to foot with snow white shells, must have been a sight worth beholding.

This is perhaps the proper place to mention another variety of head-dress which, though ceremonial in intent, was not the appanage of titled

personages. I mean the *shyas-'kei* (grizzly-bear-claws). Its name denotes the nature of its material. These claws are secured to a band of cariboo skin by means of sinew threads passed in a hole bored through their root part. A double row of dentalium shells two lengths between each claw, runs through their upper or slender half, ensuring by means of the sinew thread on which they are mounted solidity for the crown and unity for its component parts.

Fig. 172.

The grizzly bear is the lion of our mountains, and those who presume to wear its spoils thereby lay claim either to supernatural power or to uncommon courage. Such are the medicine men or shamans and a few untitled hunters too proud of their deeds and supposed prowess not to parade them on every available occasion. Such then were the natural possessors of this curious head-dress. I must add that the shamans did not confine their extravagance to the wearing of this crown; the spoils, generally the head, of any other wild beast, the wolf, the coyote (*canis latrans*) the black bear, etc., were also laid under contribution to help to impress the bystanders with the awfulness of the powers they were supposed to be endowed with. But this was only while in the act of practising their occult art.

One peculiarity of the preceding cut cannot fail to strike the reader. It is the mode of wearing the hair therein illustrated. This style was common among the Carriers. When at home, or anywhere when in repose, they had it plaited in a queue resting on the back; but when travelling they found it more convenient to tie it up in a knot behind the neck. Both men and women—exeept when widowed or in mourning

from some other cause—wore it full length and parted in the middle. Clipping the hair was a token of extreme grief or the badge of forced servitude.

Small tattoo marks will also be observed in the above figure, and not without reason. For tattooing was formerly very prevalent among the Western Dénés. This was not, as among the neighbouring heterogeneous tribes, confined to the chest or the arms and legs, but it extended in every case to the face as well. Various designs were thus indelibly stamped; but the face tattooing consisted more generally of lines, single or parallel, radiating from the mouth corners, on the chin, the cheeks, the forehead and occasionally, the temples. Fig. 173 represents an extreme case. Two women of this place—Stuart's Lake—are thus tattooed. Face tattooing had nothing to do with the totem crest, personal or gentile, of the bearer.

Fig. 173.

When figures were attempted, they consisted of crosses, fishes, birds, fern root diggers, etc., in conventional outlines, all of which will be delineated when I come to treat of the Déné pictography.

The breast was also tattooed, but not so commonly as among the Coast tribes. The figures marked thereon had generally a totemic significance. A much coveted tattoo was the symbol of the grizzly bear (fig. 195) the marking of which cost many a ceremonial banquet and entitled the person thus honoured to exceptional regard.

The forearms, inwardly and outwardly, were more often the seat of tattoo marks. When there situated, these referred as a rule to a personal totemic animal revealed in dream, and the bearing of whose symbol was supposed to create a reciprocal sympathy and a sort of kinship between the totem and the tattooed individual. Sometimes these marks on the arms and legs were intended as a specific against premature weakness of these limbs. In this case, they simply consisted of one or two transversal lines on the forearms or immediately above the ankles which were tattooed on the young man by a pubescent girl. These had about the same significance as the sinew and down wristlets of which mention has already been made.

Tattooing was performed, as among other American tribes, by puncturing the skin with fine bone (or later steel) needles, and by passing underneath a sinew thread coated with crushed charcoal or soot.

The face was also either painted with broad lines of red ochre alternating with black, or the cheeks only were made to receive a coating of rouge. Personal taste and fancy were the only rules followed. Young persons were also fond of trimming their eye-brows to a diminutive width, after which they blackened them with charcoal.

CHAPTER XI.

HABITATIONS.

It has already been stated that of the three tribes under consideration two, the Carrier and the Tsi[Koh'tin, were semi-sedentary, while the other, the Tsé'kéhne, was entirely nomadic. Consequent upon this different social status was, of course, the nature and style of the habitations proper to each. Thus the Carriers, whose social system was very elaborate and whose staple food was salmon, had formerly no less than five distinct kinds of dwellings, the ceremonial lodge, the summer lodge, the fishing lodge, the winter lodge, and, among the southern half of the tribe, the subterranean hut.

In common with the coast tribes whose social organization they had largely copied, the Carriers had formerly, as well as now, regular villages which they inhabited but part of the year. But while the former chose the winter months to enjoy the sweets of home life, the latter were never to be seen in their permanent dwellings except during the fair season. This may easily be accounted for when we remember the differences of climate. The coast owes to its proximity to the ocean the comparatively mild, if damp, weather it constantly enjoys, while east of the coast range of mountains, the winters are usually very severe. Now, as among the inland tribes, nobody, however wealthy, sleeps in more than one blanket, a large fire is kept in the lodge day and night, and so the amount of dry wood available in one place is soon exhausted. Since they are possessed of carrying conveniences unknown in olden times, this necessity of shifting one's abode from place to place is not so much felt. But formerly with their limited facilities for felling trees and bringing the wood home, they had to change every year their winter quarters.

The permanent village was thus inhabited only during the fair season, that is from the first week in May, when the grebes arrive, until the second week of September, after the family supply of salmon has been secured. The villages are generally situated at the confluence of rivers, or on the northern banks of lakes, so as to have the benefit of the sun's rays from the opposite side. In any case, the location is chosen in such spots as seem to promise the greatest fishing facilities. They were formerly composed of the ceremonial and the common summer lodges. As these differ in plan and material from those illustrated or described by writers on the coast Indians, I feel justified in giving herewith plans and explicative details of both.

And first as to the ceremonial lodge (fig. 174). It is so called from its being the seat of all large native gatherings, such as festival banquets, distributions, dances, etc. It serves at the same time as the dwelling

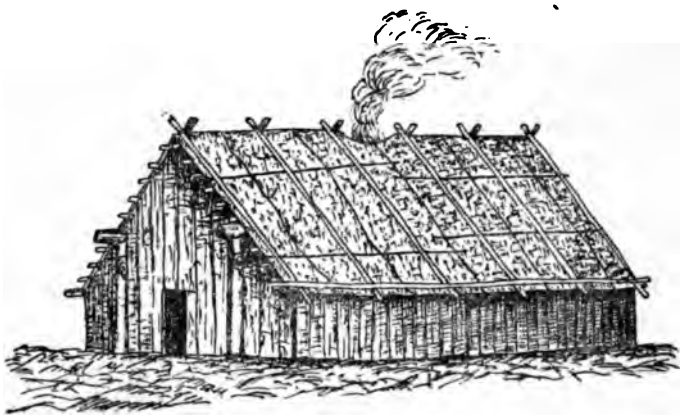


Fig. 174.

house of the nobleman to whom it belongs and of such co-gentile families as it can contain. Its erection was the occasion of great festivities and necessitated the accumulation by the future proprietor of

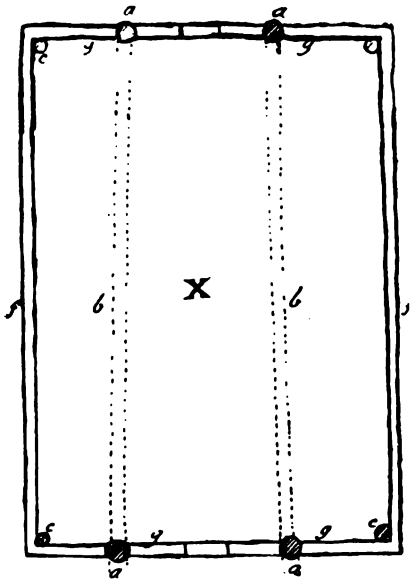


Fig. 175.

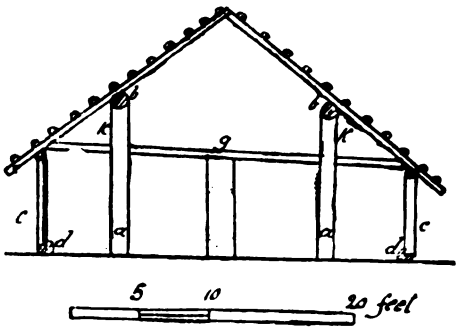


Fig. 176.

large quantities of eatables and dressed skins. Following step by step the progress of its building, which was diversified, as on the coast, by intervals of merry-making and feasting, we will proceed to a brief

description of the lodge, the ground plan and front end of which will be found in figs. 175 and 176.

The main timbers of the building consist of the posts *a* and the beams *b*, placed so as to form a parallelogram. The former are of spruce of as large dimensions as can be found. After they have been cut to the required length, they are hauled on skids to the place of construction. Let me say here that as these posts—four in number—are the mainstay of the house, they are regarded by the natives with feelings akin to reverence which are furthermore excused by the circumstance of the totem animal of the proprietor being generally carved in relief not far from their upper end *k*. For this reason, the place of honour is at their base and, in ceremonial gatherings, the noblemen were invariably seated against them, surrounded by their co-gentile suite.

After the logs had been stripped of their bark, they were rendered as smooth-surfaced as possible by means of repeated scrapings. When standing in position, their longitudinal half was made to jut out of the plank wall. Not uncommonly, they were also painted with red ochre, when a mash of carp roe served as oil and was smeared over the posts so as to prepare a sticking surface for the colouring matter. As a precaution against too early decay, the butt end of each was wrapped around with birch bark prior to its being covered up with earth.

The head of these four posts or pillars is hollowed to receive two large cylindrical beams or plates, *b*, which are cut a little longer than the length of the future lodge, so as to let their ends project in front. Four secondary posts of smaller size, *c*, are next erected on the outside of the parallelogram at equal distance from the first and form the corners of the house. They likewise support on hollowed ends two smaller plates, *f*, over which the eaves of the roof are to rest. The ends of two transversal beams of moderate dimensions, *g*, the object of which is to further solidify the structure and especially the gable walls, are then laid in a notch cut out on these minor plates. The foregoing pieces constitute the frame of the building.

Once they are in place, the erection of the roof is proceeded with As this is even to-day constructed on the same principle as formerly, it deserves special mention. The rafters, *h*, are secured together at the top of the roof by means of *'kən* or wattle of high cranberry bush *(Viburnum pauciflorum)* passed through holes pierced in the proper places. Over these are tied with willow bark, at intervals of one or two feet purlines which are then covered with spruce bark. This is secured in place principally by means of additional rafters laid over it and pressed down

by a long beam to which their lower extremities are attached (see fig. 174). As a further guarantee of solidity, slender poles are finally inserted between the bark roofing and the outside rafters. Of course an aperture is left open in the top of the roof for the smoke to escape.

There now remain the walls to construct. They consist of hewn slabs of spruce which were formerly shaved on the outside as smooth as the working tools then available permitted. The lower end of these rude planks was introduced in a channelling prepared therefor in the large beams, *d*, lying on the ground, while their upper end was engaged between additional poles running under the eaves or along each side of the gable.

Large lodges had generally two entrances, one at each gable end of the building. Their lintel was formed by the transversal, beams, *f*, and they were shut by regular board doors as is practised to-day. However, I have seen a ceremonial lodge whose doorways were simply cut in the end walls some distance above the ground, and were elliptical, as marked in outline in fig. 176. Such lodges were called *horwə-ltaz-yə*R, or "house with cuts through."

There never were any windows in the old style lodges. Full ventilation was however established through the doors, the smoke hole and the numerous wall chinks consequent on the sinking in of the boards.

The fire-place was in the centre of the building, and fire was made immediately on the floorless ground. Only two or three stones served as andirons for the wood to lie upon. The family meat or fish was, and is still, commonly either roasted by means of a wooden spit passed therein and stuck in the ground near the fire, or boiled in a kettle supported over the flames through a long stick likewise driven in the ground at a distance from the fire.

No shutter was used in connection with the smoke-hole as is done among the Haida, nor was the floor covered with any boards.

The sleeping places only were strewn with spruce branches and undressed skins, over which everyone stretched himself in his blanket with most of his clothes on. All had their feet next to the fireplace, instead of each married person having them at the head of his or her partner, as is common among the Blackfeet,* and the Eskimo.†

* Legal, *Les Indiens dans les plaines de l' Amèrique du Nord, Petites Annales O.M.I.*, Paris, 1891.

† After Rod. MacFarlane, Esq., who has passed several years among those aborigines.

There was in the lodge no partition whatever.

Sometimes related families found themselves too numerous to dwell all under one roof. Rather than cohabit with people of a different gens, they would then build for themselves the smaller summer lodge (fig. 177). Quite a number of these old fashioned buildings are still extant. They differ considerably from the large ceremonial lodge: instead of four *ĥnyəs-tcən* or principal upright posts, they have only two, one in the middle of each gable end. To facilitate the semi-circular hollowing of their upper

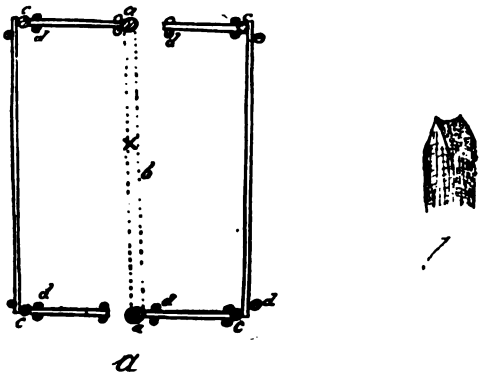


Fig. 177.

ends, these are previously thinned on each opposite side into a tapering edge (fig. 177 *b*). Four *ĥnyəs-səl* or secondary uprights, *c*, stand in the corners of the lodge. As the walls are to be superimposed poles, minor posts or stakes, *d*, are planted in the ground in pairs on each side of the wall whenever this is necessary to prevent the latter from tumbling down. After the posts of the walls have been inserted between the two opposite posts they are furthermore secured thereto, three or four together, by means of willow bark ropes. Such unimportant habitations have indifferently one or two entrances, generally without any door. Their apex is formed as in the preceding case by the transversal piece, *e*, which rests on each end of the eaves-plate. When two doorways exist, one will be on the right, the other on the left, of the main upright post in the middle.

The roof is in every respect similar to that of the ceremonial lodge. Speaking of the latter, I failed to mention that the eaves project a considerable distance from the walls.

A few ceremonial lodges were also built on the same plan as the minor dwelling houses. Their material was identical, save that instead of poles hewn planks formed the walls. In that case the totem crest was carved out of the protruding end of the top plate (fig. 188). A few even had

only one door. The place of honour was then just opposite the door, as among the Blackfeet.*

Another variety of Carrier dwelling which is inhabited only during *thal-lo-ñrən*, or the salmon season, is the fishing lodge. In general appearance it resembles the summer dwelling lodge just described, but is, if possible, more rudely constructed. Its ground plan is identical, but it wants the gable end walls above the transversal beams. The large openings consequent thereupon leave free access to the wind and air and thus accelerate the drying of the fish which are suspended on cross poles resting transversely on the top sticks of the side walls. By exception, a few of these lodges have the apex of their front adorned with the carved totem crest of the proprietor. It may be remarked that these fishing lodges are not mere sheds for the exclusive destination of smoking and curing fish; they serve also as dwellings for the fishermen during the whole space of time that they are used.

We now come to the winter lodge of the Carriers. We have already seen that, at least among the upper Carriers, new winter quarters were chosen every year in such spots of the forest as promised to yield the best supply of firewood. These habitations were therefore of a merely temporary nature. Yet they were carefully built, the greatest attention being always paid to the comforts of those about to winter therein. They were original in construction, and deserve a full description.

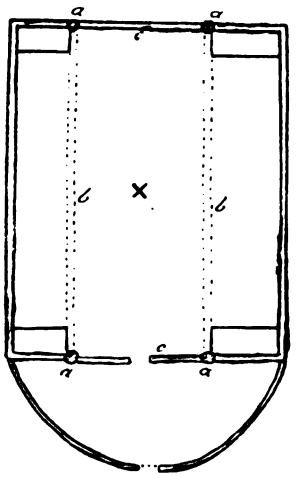


Fig. 178.

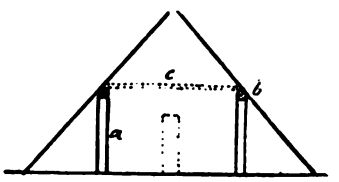


Fig. 179.

Four *ênyəstcən* or posts of moderate size with hollowed upper ends were planted in the ground and supported the usual longitudinal plates.

* Legal, *uti suprà*.

On these parallel plates split poles of spruce or cotton wood were made to recline in a slanting position so as to form a roof without walls, the split side resting immediately on the beams. To ensure additional solidity, the lower end of each stick was slightly driven in the ground, or covered up with earth. The middle ones were purposely shorter, so as to form a smoke hole in the top. A covering of spruce bark was then added, each piece of which was steadied by means of independent sticks resting thereon.

There now remained the gable ends. As with the other styles of native buildings, a *thapa-sə'a* or transversal beam (*c* of fig. 179) was laid on the side plate, *b*. Slender posts or stakes were next planted on the same plan in an upright position to fill in the end of the lodge opposite to the front. Fascines of spruce boughs or saplings were moreover laid against this wall on the outside, and all possible interstices were carefully chinked up by forcing in shoots of conifers.

The front end was more complicated. As comfort and warmth were the chief aims of the builders, the structure had but one entrance. This was obtained by introducing immediately under the apex of the gable down to the transversal plate a broad slab of spruce securely wedged between the wall posts or stakes driven in the ground. The aperture left free underneath constituted the doorway. This was shut by an independent board just a shade narrower, so as to move easily. It was suspended by means of a stout rope, and to go in or come out you need only push it ahead of you ; its own weight would cause it to return to its original perpendicular position, and thus only a minimum of cold air would steal in the building. As a further precaution against the inclemency of the season, the front end of the lodge was provided with a semi-circular door-yard with an additional door. This sort of native *atrium* resulted from a number of heavy poles or posts being made to rest at their small end on the gable wall, while their lower extremity described a half circle on the ground. The whole was then covered with brush. The outer doorway was shut with some worthless skin with the hair on, while the ground within the enclosure was strewn over with small branches of conifers, generally spruce. This enclosure, besides contributing to render the hut wàrmer, served also as a kennel for the dogs and as a bathroom for the old men. Its native name was *pən-tsiʃ* (a word of the third category of nouns).

In the ground plan, fig. 178, the space between the uprights and the corners of the lodge is purposely partitioned off. It forms what was known as the *'kûnt'ʃat tsatcən* or corner store, the sides of which consisted mainly of roughly hewn boards set up to the height of three or

four feet. Therein the family impedimenta were stowed away, and the number of such depositories generally corresponded to that of the cohabiting families.

A totally different style of winter dwellings obtained among the TsiǀKoh'tin and, through them, among the Lower Carriers. This was the *tɬizKən* or semi-subterranean hut. It had been borrowed from the two tribes' neighbours in the south and southeast, the Shushwap. Dr. F. Boas has already given * the plan and description of one which is probably of a representative character, while more lately Dr. G. M. Dawson has furnished us † with an example of a different style observed by himself among the Shushwap. None of these however tallies in point of construction with the *tɬizKən* of the Lower Carriers such as it existed among them some forty years ago. From information gathered from an eye-witness, I am enabled to give the following account of those constructed at Fraser Lake and Stony-Creek.

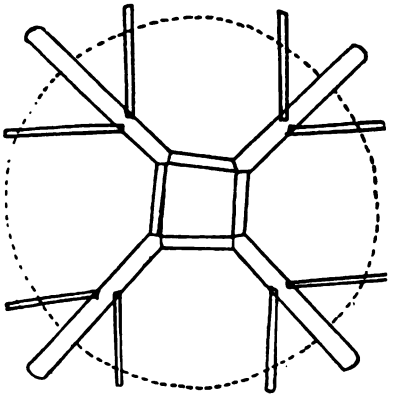


Fig. 180.

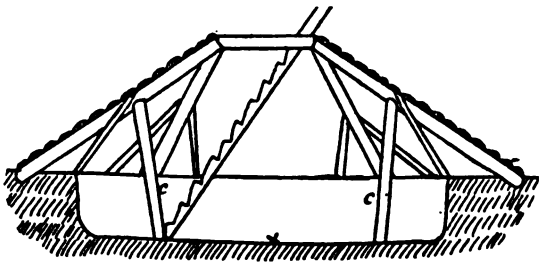


Fig. 181.

After an excavation some three feet deep and about 20 feet in diameter had been made, the butt ends of four large beams were made to rest a

* Sixth Report on the N.W. Tribes of Canada, figs. 20 and 21, Leeds Meeting B.A.A.S. 1890.

† Notes on the Shushwap People of B.C.; Trans. R.S.C. Sect. II., fig. 1, 1891.

little distance from the brim, on the original surface of the ground, while the beams converged with their small ends raised five feet or thereabouts to a point above the excavation, which was to become the door and smoke hole of the hut. These timbers were held up by means of four short pieces of wood, the end corners of which were wedged or locked in those of the larger beams, as shown in fig. 180. The aerial square orifice resulting from this combination was the doorway of the building. No other timbers were added to this frame-work, save that to further solidify the structure, two, or in larger huts, three, stout posts, *c*, forming a right angle with the main beams were planted in the floor with their upper ends notched in the beams, over which split poles were laid horizontally up to the top or rather the door.* This roof was then covered with earth. An Indian ladder—that is, a log notched at the proper stepping intervals—was the means of communication with the outside.

These huts were very comfortable, and but little fire was needed to keep them warm. From the Tsi|Koh'tin names of the months we learn that they were occupied from October-November, but how long cannot be ascertained from that source. If we are to judge from a myth current among the same tribe, it would seem that these subterranean dwellings were, in olden times, spring as well as winter homes, since they are mentioned therein as being inhabited as long as the root digging season

The habitations of the Tsé'kéhne, whether in winter or in summer, are built after the eastern or conical model. Four long poles with forking extremities are set up one against another, the lower ends of which form on the ground a square on the dimensions of which will depend the size of the lodge. A score or so of other poles are then set up in a circle. the top of each resting on the point of intersection of the first four. In winter, small fascines of spruce are laid horizontally all around the lower perimeter of this frame, so as to leave as few points of access as possible for the cold air from underneath the outer covering, which is then wrapped around the cone resulting from the converging poles. This covering consists of dressed moose skins sewn together, and its perpendicular edges correspond to the entrance of the lodge. They are either buttoned or clasped together from four or five feet above the ground up to the top. On one side of the opening thereby produced is sewn a smaller skin, which forms the door. Two sticks attached transversely thereto on the inside give it the requisite consistency, while the upper one, which slightly projects beyond the edge of the skin door, serves as a latch, its projecting

* As shown in the accompanying cuts, minor logs were however added to the main timbers, so as to facilitate the roofing of the hut.

end being, when necessary, fastened with a string to the adjoining part of the lodge covering. The smoke escapes through the interstices between the converging poles left uncovered at the top. To guard against snow, rain or adverse winds, an additional piece of skin is sewn on the outside from the apex of the conical covering down to some distance, while its free side is secured to a long pole planted in the ground close by. This appendage is utilized as a shutter wherewith the top opening of the lodge is partially or entirely covered, as the state of the weather may suggest.

The summer lodge of the Tsé'kéhne has sometimes two entrances, and in this case the outward covering generally consists simply of two blankets or skins stretched over the frame poles, one between each door. The upper half of the cone is thus left uncovered.

Summer and winter, the fire is started right in the centre and, instead of the wooden tripod used among the Blackfeet to suspend their kettles,* the Tsé'kéhne prefer a stick reaching horizontally at the proper distance above the fire to two opposite poles of the frame to which it is fastened.

Carriers, Tsi|Koh'tin and Tsé'kéhne, nowadays more generally use, during their summer travellings, either cotton tents, or shelters composed of three or four sticks thrust slantingly in the ground, over which a sheet of cotton or canvas is spread. The latter style of shelter was probably the only one known among them prior to the introduction of European textile fabrics, save that, of course, a moose skin replaced the canvas or cotton sheet.

Of course the child of the forest, when in his primitive state, can boast the possession of no artificial means of reckoning time or measuring long distances. But Dame Nature provides him with a seldom failing standard measure in the shape of the sun, the course of which is familiar to him, no matter how far he may have swerved from beaten paths. Long distances are determined by the number of camps, and shorter ones by the position of the sun in the heavens. The sun serves also as his watch by daytime, and its bearings are easily taken in by the native mind. After it has left his pine-clad mountains to illuminate unknown worlds, the aborigine again looks up above to ascertain how long he will be deprived of its beneficent rays. The Great Bear then becomes to him the hands of a God given clock, and the distance it has travelled around its axis, the polar star, over the dial which we call the heavens, is very seldom, if ever, misreckoned. The Western Dénés are familiar with a few constellations which are, as among us, called after mythic personages; but none is

*Rev. E. Legal, *loco citato.*

so widely known as *Yihta*, the Great Bear. We have already seen the role it plays in the story of the Gambler; I must be pardoned for reproducing here another legend wherein it is to be recognized under a different garb, but playing a no less important part. As will soon appear, if fable it is, sociologically speaking, it is a fable with a moral.

"There was a young man who was impatiently awating the return of daylight to set out on a hunting expedition. Again and again he would look up at Yihta, and in his impatience he exclaimed: 'That old Yihta,* how slowly he walks!' Very soon after having uttered these words, he left for the chase.

"He had not gone far before he became aware by the barking of his dogs that they had scented game. After what appeared to him as a run of but a few moments, he overtook his dogs, and lo! sitting on a log was a man of beautiful countenance, carefully painted in red stripes over the cheeks, and holding a walking stick in his hands. He had a malicious smile on his face, so that the young man felt abashed in his presence and afraid to approach him. 'Come on,' said the stranger who was no other than Yihta, 'come on, young man. So you laugh at me and say that I walk too slow? Now learn that to reach me you have travelled a very long distance, since to help you I have contracted the surface of the earth. Go back then to your home, and take this staff to aid you on your long journey. Whenever you want food, hold it perpendicularly on the ground, then drop it and observe the direction in which it falls: if it falls in the direction of the northern wind, do not go that way, for there famine is awaiting you. If it falls towards the setting sun or towards the rising sun, go either way and you will find bears to kill, both male and female. Do likewise when you feel uncertain as to the direction of your house; and when you get home, hang the staff up in the branches of a tree. Above all, beware lest a woman having her menses catch sight of it.'

"At these words, the young man took the walking stick without however giving much credence to the stranger, for he believed his home was but a short distance from where he stood. Yet these words were literally fulfilled, and during his long peregrinations, amidst incessant fatigues and ever recurring privations, the young man owed his life to his careful observance of the stranger's directions. Many were the years he travelled, and he seemed to get a glimpse of his lodge several days before he really reached it. When he finally got home, he was an old man with hair white as snow, and his lodge was crumbling down through age and decay."

---

* *Ntən Yihta'qəl!* Expressive of scorn.

From this short Carrier myth, the sociologist will learn that:—Firstly, the observation of the Great Bear as a means of reckoning time was a national custom among Carriers. Secondly, the heavenly bodies were regarded as quasi divine powers which it is wrong to speak lightly of, a deduction which might easily be proven to be legitimate by other points of Carrier psychology. Thirdly, to look handsome, a Carrier of the old stock must paint his face. Fourthly, the Carriers had a correct idea of the immensity of the universe. Fifthly, the injunction not to travel in a northern direction might perhaps be interpreted as a reminiscence of the tribe's migrations southwards. Sixthly, a woman having her menses is legally impure, and must be deprived even of the sight of any object endowed with magic powers. Lastly, more than one of those writers who are so fond of parallelisms between American mythologies and the Biblical narrative will no doubt be tempted to compare the beneficial, food-giving and road-finding staff of the young traveller with the marvellous miracle working wand of Moses which, during similarly life-long peregrinations, opened the way and found water where none was to be seen. This suggestion, however, is given for what it may be worth, and I must leave it to others to decide whether it is not too far fetched.*

Now that we have extracted *morals* enough from our fable, we revert to the description of the few items which still claim our attention.

If my information is reliable, there were formerly no fortified villages among the Western Dénés. One should not however infer from this that there was no warring among them; on the contrary, I think I am warranted in stating that atonement by compensation for losses of life, even involuntary or accidental, was much less practised here than on the Coast. But hostilities were seldom of so general a character as to involve whole villages, though some such cases are recorded in the traditions of the tribes. More commonly they were restricted to two different gentes, and their cause may have been the killing of a man openly or, as was supposed, through the black art of the shamans. In the latter case, the dying person usually revealed the name of the magician to whom he attributed his death, and nobody dreamt of questioning the truth of his would-be revelation. Naturally, more than once personal grievances must have been thus avenged. The cognate families of the real or fancied murderer would then expect reprisals at the hands of the co-gentile families of the deceased, and they would erect, generally in secluded spots of the forest, what was called *pəR-pa-yəR* or "a house for

* The Tsi[Koh'tin possess a different tradition, the principle hero of which works innumerable marvels with the help of a magic wand which they call *'toR*, a word not employed to designate any other kind of wand or staff.

the war." This primitive fort consisted of a log-house as solid as possible under the circumstances, with a strong log roofing, over which a square breastwork of small diameter was built with the same material. If not taken by surprise, the besieged shot at their assailants through loop-holes pierced in this rude stronghold, the existence of which was concealed by fascines of coniferous branches piled on the roof up to the top of its walls. Similar portholes were also cut in the walls of the house itself for service in case of a sudden attack. As a further protection against such a contingency, an addition with a second door was always made to the front end of the house. Frequently a building similar in appearance, but really of no strength whatever, was erected in close proximity so as to deceive the enemy and give time during an attack on the wrong work to the besieged to prepare for the defence. The only Déné "fort" I have ever seen was constructed just as described, but wanted the roof breastwork.

An indispensable adjunct to the native dwelling house is the *tsa-tcən** or provision store. There is stowed away the dried salmon, which is the daily bread of both Carrier and Tsiɬkoh'tin. But while both tribes practically live on the same diet, their store houses very materially differ in construction. Fig. 182 is the Carrier tsa-tcən which, as may be seen, is an aerial building. The distinctive characteristics of all these provision stores are faithfully reproduced in the cut; but their minor details nowadays vary not a little. I have chosen for illustration that which approaches nearer to the traditional type. It consists of two parallel frames planted upright in the ground, the component parts of which are furnished in the middle with transversal beams upon which rests the floor of the tsa-tcən proper. With the exception of the front end, the whole is made of heavy poles superposed one upon another or laid in close juxtaposition, as the case may be, and fastened to the frame of the building by means of *'kən* or high cranberry bush wattle. The front end is entirely of boards. All the wall poles being laid with their larger ends in the same direction, a slight inclination results at the top, which constitutes the roof of the building. This is furthermore covered with spruce bark.

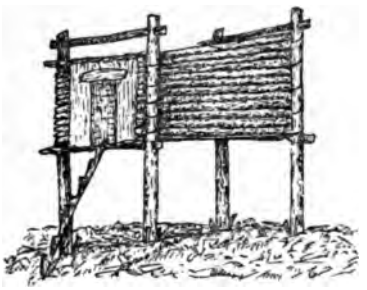


Fig. 182.

* Literally: "beaver-stick." I can see no reason for this etymology.

The tsa-tcən of the Tsi|Koh'tin are not so elaborate, since they are nothing else than small and very rude, though solid, log huts built right on the ground (fig. 183) and, as a rule, quite a distance from the regular village, while their Carrier counterparts are generally very close to the habitations.

Fig. 183.

The Tsé'kéhne have nothing to do with salmon, and consequently the need of provision stores is not so urgent among them. Yet when they happen to be blessed with an abundance of dried meat and wish to preserve it for future use they erect sorts of scaffoldings immediately against the trunk of a tall tree which are to them the equivalent of the Carrier tsa-tcən. These consist of two long, heavy sticks crossed and firmly bound to the trunk of the tree at their point of intersection, while their ends are secured to some stout overhanging branch by means of strong ropes. Rough boards or split sticks are then laid across this frame which form a floor over which the meat or any other eatable is deposited, carefully wrapped over with skins or spruce bark. Even the bear cannot get at those *caches* without previously demolishing their floor, which is practically impossible.

The careful observer who would take a fancy to travelling along our chief salmon streams could not fail to notice, in some spots immediately over the banks, numerous excavations or pits which betray an artificial origin. These are all that remain to-day of the salmon cellars of the prehistoric Carriers. Aerial stores were then as now the regular family larders ; but not unfrequently the natives of the old stock preferred to cache down their fish in temporary cellars which had the advantage of keeping it fresher than the common store-house. A matter of taste as regards the salmon itself, this caching down in the ground became a necessity relatively to its roe, which was buried, wrapped in spruce bark, until it had reached an advanced stage of putrefaction, when it was relished by the native palate as the *ne plus ultra* of delicacy.

The last item more or less connected with aboriginal habitations is the sweat-house or sweating-booth.* According to Dr. G. M. Dawson, this usually consists, among the Shushwap, "of about a dozen thin willow wands, planted in the ground at both ends. Half of them run at right angles to the other half, and they are tied together at each intersection. Over these a blanket or skin is usually spread, but I have also seen them covered with earth. A small heap of hot stones is piled in the centre,

* *Tsè-zil*, "stone-hot," a word of the third category.

and upon these, after carefully closing the apertures, the occupant porsu some water. The sweat-house is always situated on the banks of a stream or lake, so that on issuing therefrom the bather may at once plunge in the cold water."* One single point—and that a very unimportant one—differentiates the sudatories of the Carriers from those of the Shushwap: I mean the covering, which among the former is of spruce bark. Here, as further south, these sweat-houses are invariably to be found near a stream or lake; but the reason of this is merely that our Indians never dwell away from the water, for I have never heard of a Carrier taking a cold bath immediately after his steam bath. It may also be worth mentioning that, more often than otherwise, steam-bathing was originally practised for quite other than sanitary motives. It was quite commonly prompted by a desire on the part of the "patient" to ensure success during a forthcoming hunting or trapping tour, or to atone through this penitential act, for any transgression, wilful or involuntary, against the traditional laws and customs of the tribe.

* Notes on the Shushwap People of British Columbia; Trans. R.S.C. Sect. II., 1891, P. 9.

CHAPTER XII.

MONUMENTS AND PICTOGRAPHY.

A search for "monuments" among such a primitive people as the Déné cannot be but unproductive of satisfactory results. Indeed, throughout the whole territory of both the Tsi|Koh'tin and the Tsé'kéhne, not a single work is now extant which could, with any degree of appropriateness, be classed under that head. Even such as may now be seen among the Carriers are—barring funeral monuments—exceedingly scarce. All of them may be reduced to two distinct categories: wooden, carved monuments, and painted or drawn monuments. Hence the two divisions of this chapter: carved monuments and pictography.

CARVED MONUMENTS.

Genuine carved monuments are to-day very few, and seem to have always been so among the Carriers. Indeed so scarce are they that every one of those now extant will easily be illustrated herewith. I shall pass over the totemic columns of the Hwotso'ten which are still in a good state of preservation, for the reason that their carving and erection were the work of their exogenous neighbours, the Kitikson, whose nearer village stands hardly three miles off. Those monuments are merely witnesses to the influence exercised by outsiders over a very unartistic race, and the custom of erecting them had not been adopted by the main bulk of the Carrier tribe. This cannot be said of the famous commemorative mortuary columns so common all over the North Pacific Coast, and which had been appropriated as far inland as the boundaries of the Tsé'kéhne territory. All of these have long disappeared, with the exception of the two herewith represented, which I sketched ten years ago at ⌐rak, a village site among the Nutca'tenne, the population of which is now extinct. These columns are a further corroborative evidence of my thesis, viz., that the Déné race has no eye for the beautiful. Compared with those of the Coast Indians, they stand in the relation of an undeveloped embryo to the matured being. As is well known among Americanists, such works served as depositories for the few remaining charred bones of the deceased, and were erected in close proximity to the village. The two specimens figured below are rather plainer than the average mortuary column of the Carriers since, according to my informants, the totem crest of the deceased was generally carved in

relief thereon. These monuments were, as a rule, grouped according to the different clans obtaining among the tribe. This arrangement has survived in the column fig. 185, which now stands at Fort Babine in the

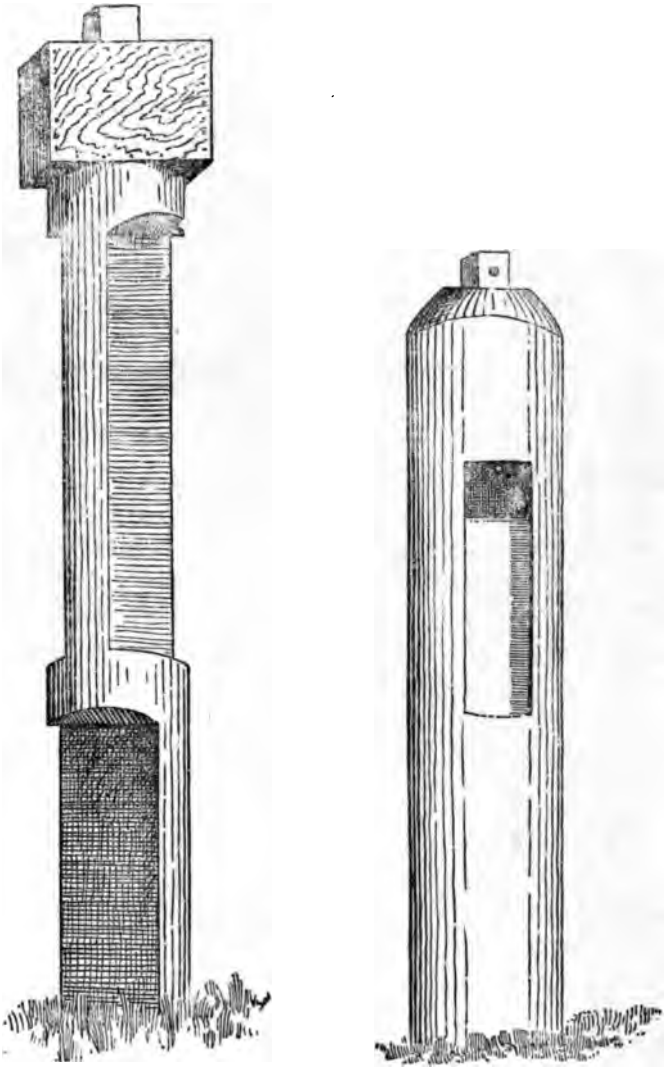


Fig. 184.

midst of the graves of *Tsa-yu-ne*, one of the native gentes, the chief totem of which is the beaver. It was, of course, erected in pre-Christian times. Such is also the case with regard to the grave shown in fig. 186,

whose occupant was likewise a fellow of the Beaver clan. His grave is to be found at *Tsé-tcah*, on the confines of the Hwo-to'tin territory.*

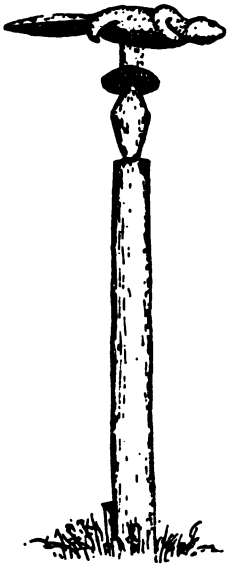


Fig. 185.

Fig. 186.

In fig. 187 the totem crest of the old days has been replaced by the Christian symbol which now appears over all the native Déné graves. These monuments affect a multitude of forms and designs, though by

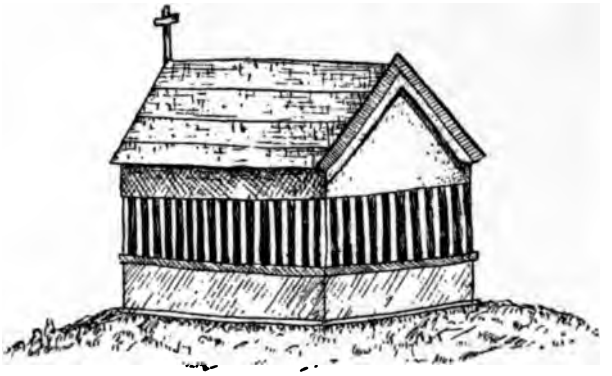


Fig. 187.

far the greatest number of them resemble, in a general way, that herewith illustrated. It is over a late grave, and is painted in several gaudy

* See the map affixed to my paper; Are the Carrier Sociology and Mythology indigenous etc.? Trans. R.S.C. Sect. II., 1892.

colours, the severity of the black and white of the rubrics being repugnant to the native taste which sees in such works no monuments of grief or sorrow, but rather affectionate tributes to the memory of the dead which it behooves one to make as showy as possible. This explains why some of them are so absurdly large, sometimes graves, even of children, being covered with "monuments" affecting the shape, and almost the dimensions, of rectangular cart-sheds.

To the above let us add the wooden totem crest ornamenting two native houses and we will have the sum total of all the carvings now to be seen throughout the whole territory of the Tsi[Koh'tin, the Carriers and the Tsé'kéhne. Of these sculptures, the first only (fig. 188) can

Fig. 188.

boast a few scores of years. It represents a raven standing over the head of some marine animal—possibly the orca. The reason of this incongruous coupling may probably be seen in the fact that the inhabitants of the place wherein the totems are to be found are of mixed parentage, as they have considerably intermarried with their western neighbours, the Bilqula. The last carving (fig. 189) is quite modern. The owl thereby represented has been carved out of a balsam poplar tree (*Populus balsamifera*) and adorns the front gable end of a fishing shanty at the outlet of Lake Stuart.

References to the totems and gentes of the Western Dénés have been frequent in the course of this monograph, and, especially in view of what remains to be said in the latter part of this chapter, some more detailed information concerning them may be found acceptable.

F. G. Frazer, the principal authority on Totemism, says: "Considered in relation to men, totems are of at least three kinds: (1) The clan totem, common to a whole clan, and passing by inheritance from generation to generation; (2) the sex totem . . . ; (3) the individual totem, belonging to a single individual and not passing to his descendants."*

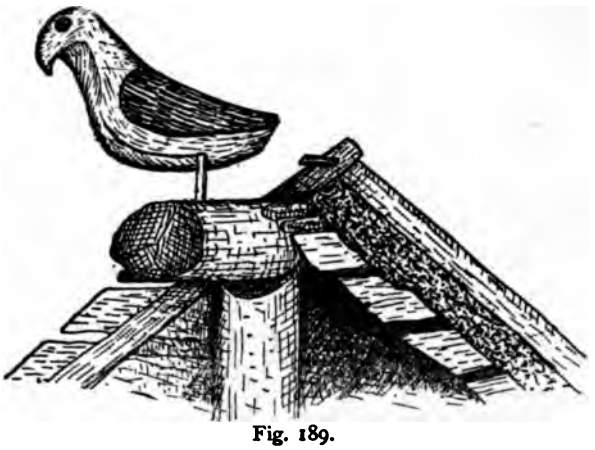


Fig. 189.

Of the sex totem I know practically nothing, as it does not obtain among our Indians; but to these three varieties of totem I can add a fourth, which I shall call the honorific totem, and of which a full explanation will be found further on. The individual or personal totem is well known as being some material object or being, most generally some animal, ordinarily revealed in dreams to a person who is bound thereafter to look upon it as sacred and to be especially revered and protected. In return for this reverence on the part of the person, the totem is believed to particularly help and powerfully protect its human relative, as the individual is supposed to be. As for the clan totem, any reader of Americana is too familiar with it to be in need of any definition or explanation. One totem generally—though not always—corresponds to one clan or gens, so that the former and the latter are very often in equal numbers. Four gentes obtain among the Carriers, of all which I herewith submit the native names together with those of their respective totems.

GENTES.	TOTEMS.
ʔt'səməc-yu.	The Grouse.
Tsu-yu.	The Beaver.
Yəstl-yu.	The Toad.
Təmi'ten-yu.	The Grizzly Bear.†

* Totemism, Edinburgh, 1887, p. 1.

† Judging from fig. 188, it would seem that the crow or raven is regarded as the totem of some clan among the Lower Carriers. It is not known here in that capacity.

With the exception of Tsa-yu, which means "Beaver-medicine," those words are untranslatable and are probably imported from among the heterogeneous tribes from which the whole system is undoubtedly derived. The first gens, ⌐t'səməc-yu, is by all odds the most powerful among the Carriers, while the two last named are considered as having a sort of affinity which entitles the members of each to mutual consideration and protection. The name of the latter, Təm'ten-yu in Babine, is changed to *Kwən-pa-hwo'tenne* * among the Carriers proper.

In great native festivals, the totem of the celebrating clan was carved and exposed at the door of the lodge so that every exogentile incomer may have an opportunity of presenting it with anything of value which he may intend for the givers of the feast with the tacit, but well-known, understanding that it be subsequently paid for by a donation of at least equal worth. Even the public naming of one's gentile totem by a member of a different clan demanded the gift of a blanket, a piece of dressed skin, or any article of wearing apparel, so that the crest may not remain ignored and the whole gens thereby dishonoured.

An important sociological peculiarity which I have nowhere else noted claims attention in this connection. The clan totem is called *nətsi* in Carrier. But beside the nətsi there existed here another kind of totem which I have named the "honorific totem." It was personal and did not pass to one's descendants, though it differed from that revealed in dreams. Its native name was *shən-'koh*, a compound word which may be freely translated by "rite." It was voluntarily assumed with an accompaniment of befitting ceremonies by any titled or untitled individual who wished to advance in social standing. It entitled the owner to special consideration, though the latter could on that account lay claim to the possession of no hunting grounds nor to the exalted rank which was the strict property of the "noblemen" or *təneza'*. In a word, those honorific totems created a sort of middle class, the *bourgeoisie* of the Carriers. They were many and varied, and, with the exception of one, they followed the clan in such a way that those proper to one could not be assumed by a member of another. Here are those now remembered by the natives:—

To the ⌐t'səməc-yu belonged the Owl, the Moose, the Full Moon, the Weasel, the Wind, the Crane, the Wolf, the "Darding Knife," the "Rain of Stones," and the Brook Trout.

Of those pertaining to the Tsayu or Beaver gens, only the Mountain Goat is now remembered.

* "Inhabitants of the fireside."

The Yəsîlyu had the Sturgeon, the Arrow, the Porcupine, the Wolverine, the Red-headed Woodpecker, the Cattle and the *Təlt'sâ*, a kind of fabulous animal resembling a gigantic toad, with large, bulging eyes.

My informants know of only the Goose as belonging to the Təm'tenyu clan.

Another honorific totem or crest was called *Sənnaɟ*, a word of extraneous origin. The exact nature of this cannot now be defined, as the mimicking accompanying its exhibition is but vaguely remembered. All that is known for certain is that it was very highly appreciated and, as a rule, it was the appanage of the notables exclusively. For here I must remark that even the notables or noblemen were not debarred from assuming one or more of the different honour crests proper to their gens.

Luɟem is another word of forigin origin which designated the Bear as an honorific totem.* It could be assumed by anybody, irrespective of clannish differences.

The connection of the individual with his crest appeared more especially during ceremonial dances, when the former, attired, if possible, with the spoils of the latter, was wont to personate it in the gaze of an admiring assemblage. On all such occasions, man and totem were also called by the same name. The adoption of any such "rite" or crest, was usually accompanied by initiatory ceremonies or observances corresponding to the nature of the crest, followed in all cases by a distribution of clothes to all present. Thus whenever anybody resolved upon getting received as Luɟem or Bear, he would, regardless of the season, divest himself of all his wearing apparel and don a bear skin, whereupon he would dash into the woods there to remain for the space of three or four days and nights in deference to the wonts of his intended totem animal. Every night a party of his fellow-villagers would sally out in search of the missing "bear." To their loud calls: *Yi! Kəluɟem!*† he would answer by angry growls in imitation of the bear. The searching party making for the spot where he had been heard, would find by a second call followed by a similar answer that he had dexterously shifted to some opposite quarter in the forest. As a rule, he could not be found, but had to come back of himself when he was speedily apprehended and conducted to the ceremonial lodge, where he would commence his first bear-

* The Déné word for Black Bear is *ɔ̄ɔs* or *ɔ̄as* according to the dialect.

† Words of Tsimpsian parentage meaning apparently: Come on, Bear! The nature of those words plainly denotes the origin of the whole institution.

dance in conjunction with all the other totem-people, each of whom would then personate his own particular totem. Finally would take place the potlatch of the newly initiated "bear," who would not forget to present his captor with at least a whole dressed skin.

The initiation to the "Darding-Knife" was quite a theatrical performance. A lance was prepared which had a very sharp point so arranged that the slightest pressure on its tip would cause the steel to gradually sink into the shaft. In the sight of the multitude crowding the lodge, this lance was pressed on the bare chest of the candidate and apparently sunk in his body to the shaft, when he would tumble down simulating death. At the same time a quantity of blood—previously kept in the mouth—would issue from the would-be corpse, making it quite clear to the uninitiated gazers on that the terrible knife had had its effect, when lo! upon one of the actors striking up one of the chants specially made for the circumstance and richly paid for, the candidate would gradually rise up a new man, the particular *protégé* of the "Darding Knife."

PICTOGRAPHY.

"All the known graphic systems originate in a picture-writing as rude as that of the American Indian or of the South African Bushman. All have advanced from the picture to the conventionalized hieroglyphic representing an idea or a word; while from the hieroglyph has sprung the syllabary represented by rougher sketches of the monumental emblems, and requiring a smaller number of necessary symbols. Finally among the more civilized of ancient races the alphabet was gradually introduced as a simplification of the syllabary which reduced the necessary emblems to about a fifth of their previous number."* Gauged after this criterion, the Western Dénés may be said to have been in a state of transition between the first and the second stage of graphic culture; or perhaps, it would be as correct to say that they were already in the second while retaining lingering reminiscences of the first. Their petroglyphs were in a large measure pictures with some admixture of conventionalized forms; but their usual means of communication while travelling and their tattoo marks had, to a great extent, become the mere shadows of the original pictographs.

Of their rock inscriptions I cannot find any better specimen than that reproduced in fig. 190. Its most conspicuous character represents a grizzly bear, the tracks of which may be seen some distance behind. The waving lines at the bottom stand for water, wherefrom a sturgeon

* From an article in the "Edinburgh Review," reproduced in Little's Living Age, Aug. 23, 1890, p. 451.

is seen emerging. The natives are not agreed as to the meaning of the large spider-like figure to the left, but the probability is that it is intended to represent Yihta, the Great Bear. Immediately above is a toad in a somewhat conventionalized shape, while below, and to the left, are two figures of birds, the lower one of which is a grouse. The other signs are the emblems of fishes, figures of men or symbols of objects which cannot now be identified. There is no *ensemble* or unity in the whole. It is only an aggregate of pictures or signs painted in red ochre by different individuals and at different times. Most of them are very old.

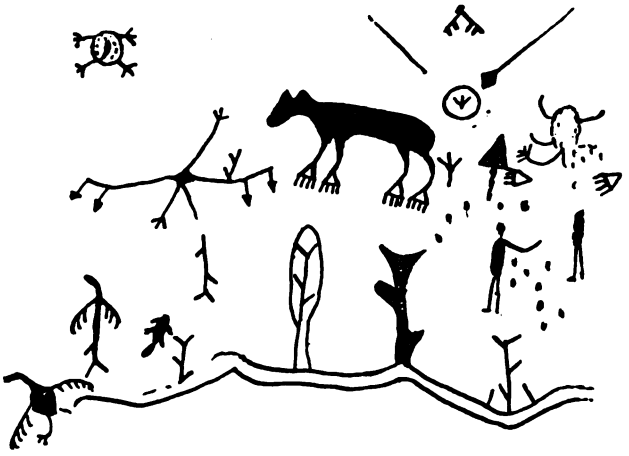


Fig. 190.

The various objects represented are personal totems, and the object in view in depicting them on rocks will be better understood by a reference to the locality of the inscription reproduced above. It is to be seen about half way between this place, Stuart's Lake or Na'kraztli and Pîntce, the nearest village by water. By painting in such a conspicuous place the totem which had been the object of his dream, the Pîntce Indian meant to protect himself against any inhabitant of Na'kraztli, as the intimate connection between himself and his totem could not fail, he believed, to reveal by an infallible presentiment the coming of any person who had passed along the rock adorned with the image of his totem. Thus it will be seen that clairvoyance had adepts even in such an out of the way place as Stuart's Lake.

Fig. 191 is, of course, a mere picture. The oval circle wherein the cariboo stands is intended to represent a mountain. A shield is instinctively called to mind by fig. 192; but the natives are positive that this is a false impression, as the inner circle stands for a den within or upon a mountain. The four figures between the two circles are the known

emblems of the beaver; but the meaning of the whole figure is not very clear. Such is the case with fig. 193, wherein some say we have a crane, while others profess to see therein some large species of beetle.

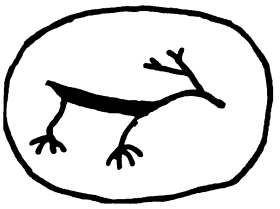


Fig. 191.

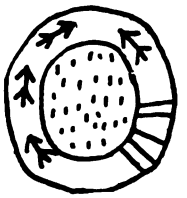


Fig. 192.

Fig. 193.

So far we have dealt with signs or pictures such as seen in stone inscriptions only. But it is chiefly through the tattoo markings or the signs occasionally executed in charcoal while travelling that the Carriers have shown their departure from the earliest or pictorial stage of the graphic art. Even within such classes of totemic representations the gradual alteration from the pictorial or life-like forms to the mere conventional outlines is easily discerned. I need adduce no better illustration

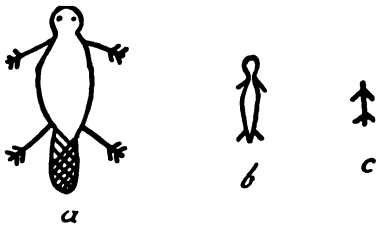


Fig. 194.

of this than the three styles of representing the beaver shown in fig. 194. *A* is the original pictorial form, and is adopted whenever the beaver is tattooed on the breast; *b* is a middle, altered form, with a strong tendency to simplification, and is used in connection with face tattooing, whilst *c* is the conventionalized form of the same, and is the common mode of representing the beaver in those rude, ephemeral drawings in the woods, though it is occasionally found even in ancient rock inscriptions.

I have already stated that tattooing on the breast was rare among the Western Dénés. This is so true that I know of no other totemic marks there situated than the few exhibited herewith. We have just seen that *a* stands for the beaver, *b* represents a toad, *c* and *d* are the fore and hind paws of the grizzly bear, while *e* is the figure of the moon.

All the face tattoo marks which can now be seen or remembered among the Carriers are found in fig. 196. They may be briefly described

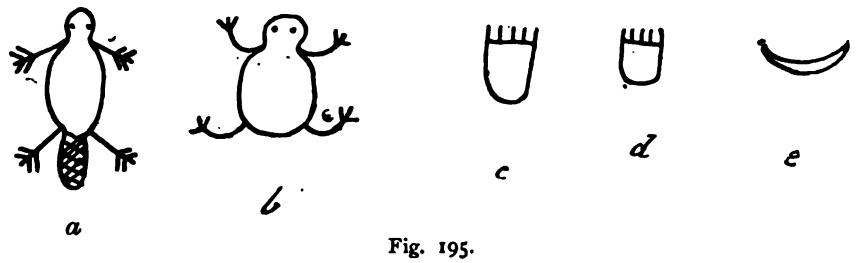


Fig. 195.

thus:—*a* is the emblem of the otter; *b* that of any fish; *c* that of a bird; *d* is a beaver; *e* is the *silhouette* sign of a stick in the water; *f* that of a

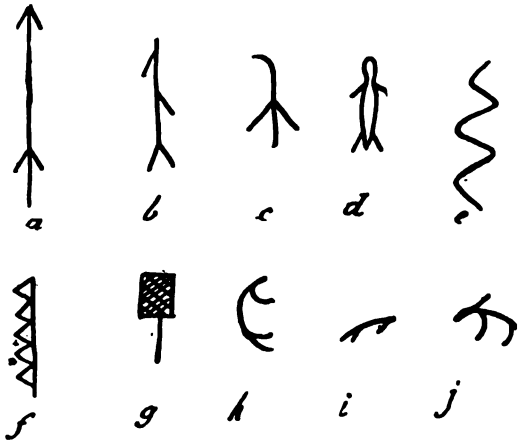


Fig. 196.

mountain; *g* is a fern root digger; *h* is the symbol of the marten; *i* that of the lizard, and *j*, that of the cariboo.

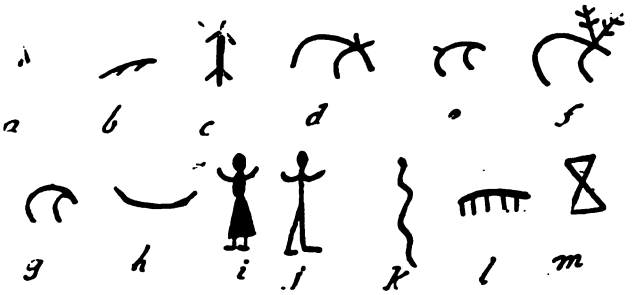


Fig. 197.

Fig. 197 presents us with the graphic signs used as means of communication between different hunting parties. They alone might be

pointed to as the elements of native "writing." The two last are taken from rock inscriptions. They are now unintelligible to the Carriers. Here is the meaning of the others:—*a*, bird; *b*, lizard; *c*, beaver; *d*, bear; *e*, lynx; *f*, cariboo; *g*, marten; *h*, canoe; *i*, woman; *j*, man; *k*, snake.

These are generally drawn in charcoal on trees or, by exception, on stones, and as such it must be confessed that they afford but a very restricted medium of expression to the native mind. It has therefore to call into requisition any other material means which may be at hand, and it must be said that the use made of them is sometimes wonderful. I was lately travelling in the forest at a time when the yearly re-appearance of the salmon was eagerly looked for. At a certain spot not very far from a stream we came upon one of those aboriginal drawings made by an old man who had no knowledge of the syllabic signs now used to write the Dêné languages. The drawing represented a man with a woman, a horse with a burden, the emblem of a bear with three marks underneath, and a cariboo. Above the whole and hanging from a broken branch were four pieces of young bark cut out in the conventional form of the fish. Now the message was instantly read by my companions, and it ran thus: "Such a one (whom they named)* has passed here with his wife, and a good load of furs, after having killed three bears and one cariboo; and furthermore he captured four salmon *two days ago*. He is now gone in the direction that we follow ourselves." This date could evidently not have been told had the Indian marked with charcoal the sign of the salmon. He was so well aware of this and was so much intent upon fixing the time of the first appearance of the fish that he had had recourse to the pieces of bark, the relative degree of freshness of which he knew could easily be determined by the experienced eye of his fellow Carrier.

This leads me to detail the various non-graphic means of communication between the different bands of huntsmen. Does the traveller intend to mark his passage in the forest? He cuts a switch or rod and plants it in his trail pointing to the direction he is following. Is he in distress, and does he beg for succour at the hands of those who he knows shall pass by the same trail? Forthwith he breaks or bends the top of as many shrubs as possible all along his path. No native party will profess ignorance of his meaning nor, as a rule, leave unheeded his appeal. Other significant combinations will be found sketched in our last figure. Thus *b*, a stick broken by the middle, means: "we are going to camp a

* They identified him by the very circumstance that he travelled with a horse, as he was the only one likely to pass there who possessed such an animal.

short distance off. You need not be in a hurry". *C* has the opposite meaning: "we are going to camp a long distance from here; hurry up!" By disposing the stick as shown in *d*, the natives are understood to say: "we have turned back awhile, but finally gone on." *E* is intended to represent a piece of burnt rag hanging from a bent down rod; it is the signal of famine and an appeal for help, the direction of the stick always

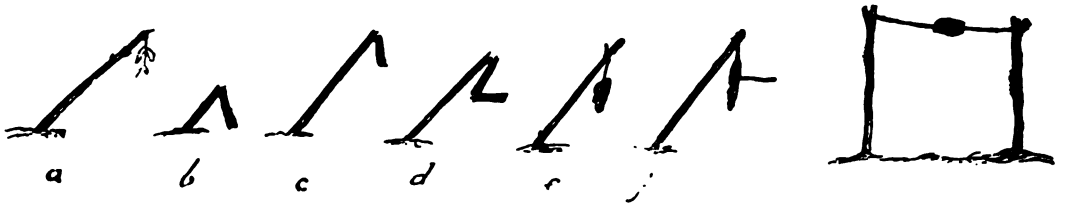


Fig. 198.

pointing to the trail of the distressed party. If, instead of parched rags, an abundance of cariboo or moose hair is to be seen on the stick, the reading must be just the reverse. It is then a notification that the party has killed plenty of cariboo or of moose, and, at the same time, an invitation to go and help dispose of them. *F* is a small bunch of dry grass wherein a small rod has been driven as an indication that a member of the band has been shot. Lastly, when a short stick is found hanging across the trail, as shown in *g*, everybody will understand that a person in the preceding party has come to his death from natural causes.

INDEX.

N. B.—When the same subject is treated in several consecutive pages, only the first is given.

A.

Ages (the prehistoric) not strictly successive, 137.
Ahtena, not Déné, 15.
Alluvial strata, their age exaggerated, 42.
Animals hunted by the Western Dénés, 93—large ones never killed for oneself, 95.
Antiquity of archæological objects exaggerated, 39.
Anthropology, an uncertain criterion of ethnological differences, 17.
Apaches, their habitat, subdivisions and population, 13.
Archæological remains, their age exaggerated, 41.
Archæology of the Egyptians and the Assyrians easy to fully describe, 5.
Armour, wooden, 117—skin, 149.
Arrow-heads, 53—bone, 55—how connected with the shaft, 55.
Arrows, 56—their varieties, 56—how released, 57.
Arrow-shafts, 55.
Aspen, its root used against bleeding, 130.
Astringents, native, 131.
Athapaskan, inappropriate as a generic name, 9.
Atiyéh, a Carrier game, 81.
Atlih, a Carrier game, 78.
Atnas, Adənas, etc., not Déné, 17.
Atrium of winter lodges, 190.
Awls, bone, 69.
Axes, of unpolished stone, 43 — partially polished, 44—polished, 46—how used, 47—of iron, 140.

B.

Babies, how carried, 134.
Babines, their physical peculiarities, 18—habitat, 27—subdivisions, 27—their gambling sticks, 78.
Bad-People, a Déné tribe, its habitat and population, 16.
Bag-net fishing, 91.
Bags, their varieties, 146.
Bait of bone, 72.
Bandelier on the early Navajos, 12.
Bark peelers, 76—bottles, 135.
Bark vessels, 120.
Bear, what part of it not eaten, 107—how its skull is treated, 108—as a totem, 205.
Bear traps, 95—snares, 99.
Beard, not rare among the Babines, 18—how trimmed among the Tsé'kéhne, 139.
Beaver, what part of it not eaten, 108.
Beaver Indians, a branch of the Tsé'kéhne, 11—their habitat, 29.
Beaver snaring, 66—nets, their working, 67—trapping, 87.
Belts, weaving of, 157.
Berries, how treated, 127.
Berry baskets, 122—boilers, 126.
Bible, its authority undiminished by archæological discoveries, 40.
Black-feet, their usual position while sleeping, 187.
Bleeding, how practised, 82.
Blue berries, how prepared, 127.
Blunt arrows, 57.
Boas' map incorrect in one particular, 22.
Boilers, 125.
Bone baits, 72.
Bone implements in use among historical nations, 43.
Bones of animals, how eaten, 49.
Bones of the dead, how treated after cremation, 146.
Bottles, for the castoreum, 66, 135.
Bow-points, 60.
Bows, of the Tsé'kéhne, 58—of the Carriers, 59—how held while shooting, 60
Bowstrings, how made, 58.
Boyle on palæoliths, 63.
Bracelets, 139, 172.
Breast-blankets, 164.
Breast-plates, ceremonial, 167.
Breech-cloth, ceremonial, 180.
Brinton on the distribution of the Dénés, 14—on the Kenai, 15—on Déné technology, 35.
Bronze age, contemporaneous with stone age, 137.
Bulbous root diggers, 115.

C.

Callbreath on the Tahl-tan Indians, 35.
Cambium scrapers, 76.

Canoes, 114.
Cap-holders, 83.
Caps of the Carriers, the, 164.
Cariboo-eaters, their habitat and population, 16.
Cariboo skins, how treated, 68.
Cariboo snares, 100.
Carrier Indians, (the), progressive, 5—their population, 16—physical characteristics, 17—timid, 18—habitat, 24—subdivisions, 24—sociologically considered, 28—their bows, 59—their bow-points, 60—their bone scrapers, 70—their utensils, 120—how they carry their babies, 134—using copper and iron before contact with the whites, 137—their drums, 150—formerly practically unacquainted with snow-shoes, 151—their weaving method, 156—their ordinary head-dress, 164—their ceremonial costume, 172—their houses, 184—their store-houses, 196—their mortuary columns, 199—their graphic system, 206.
Carvings, 199.
Castoreum bottles, 66, 135.
Categories of Déné nouns, 32.
Ceremonial dress of the Carriers original, 172.
Chaldean head-dress compared with that of the Carrier noblewomen, 177.
Charcoal, as a means of ornamentation, 170.
Cherokees, mound-builders, 39.
Chickasaw, mound-builders, 40.
Chippewayans, not the southernmost of the Déné tribes, 9—their habitat and population, 16.
Chipping, how done, 65.
Clans of the Carriers, 203.
Cloaks, 164.
Clubs, war, 64.
Columns, mortuary, 199.
Combs, 117.
Confession to the shaman, 107.
Continence, regard for, 107.
Copper, in use in prehistoric times in the Mackenzie valley, 136—in use contemporaneously with stone implements, 137—in use among the prehistoric Carriers, 137—how procured formerly, 137—its use probably ancient, 138.
Copper tower, the, 137.
Cow-parsnip, how eaten, 129.
Cradles, 133.
Cranberry, swamp and highbush, eaten, 127.
Craniometry, an uncertain criterion of ethnologic certitude, 17.
Crescents in the septum, 167.
Crossbows, 59.
Cuirass, of wood, 117—of skin, 149.
"Cut arrows," 56.
Cuticle (inner) of skins, how removed, 70.

D.

Daggers, of stone, 63—of steel in pre-European times, 142.
Dall on labrets, 170.
"Darding Knife," the, 206.
Déné (the), progressive, 5—their name, 8—the nature of their territory, 11—divided long ago in two camps, 12—their distribution, 13—misconception as to their ethnographical status, 14—classification and population of all the tribes, 16—points of physical similarities, 18—psychologically differing among themselves, 18—philologically homogeneous, 21.
Déné Dindjié, improper as a collective name, 9.
Dentalium, its fitness as an article of ornamentation, 178.
Dentalium nose-ornaments, 168.
Devil's bush, its medical properties, 132.
Dip-nets, 159.
Dishes, 119.
Diuretics, native, 131.
Dog collars, 139.
Dog-Ribs, a Déné tribe, its habitat and population, 16—knew copper before contact with the whites, 136.
Dress of the Western Dénés, 162—of pubescent girls, 165.
Drills, 143.
Drinking tubes, 82.
Drums, 150.
Dug-outs, formerly unknown, 115.
Dyes, 173.

E.

Ear pendants, 166.
Eastern Dénés: knew of copper before contact with the whites, 136—their dress, 162.
Elk, now disappeared from among the Carriers, 93.
Emmenagogue, native, 131.
ƺs, a fish-trap, 89.
ƺsroñh, how cooked, 116.
ƺstas and the swans, 104.
Ethiopians, using stone and bone weapons, 42.
ƺzih, 53.

F.

Fat scrapers, 68.
Feathering of the arrows, how made, 56.
Febrifuge, native, 130.
Fenni, (the), using bone arrows, 43.
Fern root, how cooked, 116.
Fern root diggers, 115.
Finger rings, 140.

Fire, primitive mode of starting a, 114.
Fire-bags, common, 148—ceremonial, 180.
Fire-place, where situated, 187.
Fire-wood, how procured by the poorer classes, 47.
Fishes, species of, 73.
Fish-hooks, 72.
Fishing, 71—with bait, 72—with traps, 84.—with bag nets, 91.
Fish traps, 84.
Fish trays, 123.
Flaking, how done, 65.
Floats, 111.
Folk-lore, differs according to the tribe, 21.
Forts, 195.
Foxes, different varieties in the same litter, 95.
Fox snares, 102.
Fraas on ancient weapons, 42.
Frazer on the varieties of totems, 203.

G.

G and W commutable in the Aryan languages, 8.
Gambler and the Great Bear, the, 79.
Gambling-sticks, 77.
Game sought after by the Western Dénés, 93.
Games of the Western Dénés: *nət'sə·a*, 78—*atlih*, 78—*atiyéh*, 81—*təlquh*, 111—*tə'ko'*, 112—*nəzas*, 112—*'keilapas*, 112.
Gentes, their number, 203.
Geology against the great age attributed to archæological remains, 42.
Gorgets, unknown, 35.
Gouges, unknown. 35.
Graphic systems, their origin, 206—that of the Carriers, 208.
Graves, monuments on, 200.
Great Bear and the Gambler, the, 79.
Great Bear and the Hunter, the, 194—deductions from that legend, 195.
Grizzly Bear, are there two varieties of it? 94.

H.

Hair, sometimes fair among the Carriers, 18—mode of wearing it, 181.
Hair scrapers, bone 69—steel, 143.
Hair tweezers, 138.
Hale on the country of the Eastern Dénés, 11.
Hammers, stone, 47.
Hares, a Déné tribe; its habitat and population, 16.
Head-dress of the Carriers, 164—of the pubescent girl, 165—of the same when of noble parentage, 166—of the noblemen, 173—of the noblewomen, 177—the same compared with that of the Chaldean Kings, 177—of the shamans, 181.
Head-scratchers, 82.
Heart of animals, not eaten, and by whom, 107.
Hemlock, its medical properties, 132.
Hæmorrhage, how stopped, 131.
Hides, how dressed, 49, 69, 145.
History against the great age attributed to archæological remains, 42.
Hole-borers, 143.
Horse-tails, their medical properties, 131.
Houses, *see* Lodges.
Hupa, their habitat and numbers, 13, 16—their influence over neighbouring tribes, 19—their conservatism, 20.
Hurdles for the salmon weirs, 85.
Huts, subterranean, 191.

I.

Ice-breakers, 75.
Ice-scoops, 156.
Indians, mound builders, 40.
Industries, why and how treated of, 6.
Iron, in use among the negroes of Africa, 137—in use among the pre-historic Carriers, 140.
Iron, axes, when first introduced, 140—how iron tools were prized on the Coast, 142.

J.

Juniper, its wood used to make bows with, 59—its boughs used as a febrifuge, 130.

K.

Kekule houses, 190.
'Kən, 85, 186, 196.
Kenai, their ethnographical status, 15.
Kəs, their use, 87.
Kettles, prehistoric bark, 125.
Kinnikinik, its berry eaten, 128.
K"naia-kho-tana, their ethnographical 'status, 15.
Knap-sacks of the Carriers, 148.
Knives, salmon, 51—skinning, 51—carving or working, 52.
'Kûntzai, their make and working, 87.
Kutchin, identical with Loucheux, 15.

L.

Labrets, 170.
Ladles, 75—how made, 76.
Lances, known to prehistoric Carriers, 149.
Land-locked salmon, how captured, 74.
Language, the chief characteristic of man, 21.—of the Carrier subdivisions a little different, 27.

Length measures, 92.
Lenormant on iron in Africa, 137.
Lichen, how eaten, 130.
Lily, its bulb eaten, 129.
Lipans, habitat and present population, 14, 16—a dishonest tribe, 19.
Lodges, ceremonial, 185—common, 188—fishing, 189—winter, 189—of the Tsé'kéhne, 192.
Looms of the Carriers, the, 156.
Loon and the Old Man, the, 171.
Loucheux, identical with Kutchin, 15—their habitat and population, 16—their dress, 162.
Lubbock (Sir John), mistaken as to the age of archæological finds, 41.
Luɬem, or Bear totem, how assumed, 205.
Lyell (Sir Charles), mistaken as to the age of archæological finds, 41.
Lynx, feared by the women, 108.
Lynx and the Woman, the, 108.
Lynx traps, 97—snares, 101.

M.

Maize, not grown by the Déné, 36.
Man, his age absurdly exaggerated, 41.
Marmot skins, how treated, 68.
Marmot traps, 98—snares, 103.
Mas, 67.
Masks, 118.
Material of the arrow and spear heads, 53—zealously guarded, 65.
Mats of the TsiɬKoh'tin, the, 157.
Maul, wooden, 111.
Means of communication while travelling, 210.
Measures of length, 92.
Medicinal herbs, 130.
Menses, observances relative to the, 107.
Mesh-sticks, 158.
Middle class of the Carriers, 204.
Mittens, 164.
Mocassins, their material, 163—not used in rainy weather, 163.
Months, their native names, 106.
Monuments, rare, 199.
Moose skin scrapers, 143.
Morice on the varieties of Déné nouns, 32—on the "cut-arrows," 56—on beaver snaring, 66—on fern root cooking, 116—on the introduction of copper among the Carriers, 137—on the head-dress of pubescent girls, 165.
Morse on arrow release, 57.
Mortars, unknown, 35.
Mortuary columns, 199.
Mosaical chronology, its accuracy not weakened by modern discoveries, 40.
Mounds unknown among Déné, 35—the work of Indians, 40.
Muskokis, probably mound-builders, 40.
Muskrat trapping, 87.
Mythology, why occasionally referred to in the monograph, 7.

N.

Nah'ane, different spellings of their name, 31.
Na'kwəl's descendants, 141.
Navajos, long established in the south of the United States, 12—their habitat, 13—still old fashioned, 20—philologically congenerous with the Northern Dénés, 22.
Nazrwət, a fish trap, 85.
Necklaces, 170.
Needle pouches, 149.
Nets, their material, 159—beaver, 67.
Nət'ɔ·a, a game, 78.
Netting, 158.
NəyəRhwollus and the Gambler, 79.
Nəzaz, a game, 112.
Niblack on maize growing Indians, 35.
NiKɔdn'ai, 168.
Northern Déné, timid and not industrious, 18—of assimilative dispositions, 19.
Nose-pendants, 167.
Nose-rings, 168.
Nouns, the four categories of Déné, 32.

O.

Observances of the hunters and women, 106, 165.
Ochre (red) as a means of ornamentation, 170.
Old man and the Loon, the, 171.
Oregon grape, how eaten, 129.
Orthography of Indian words, 34—of the names of Indian tribes, mixed, 30.
Osier-willow, its medical properties, 131.

P.

Packing, how done, 118.
Packing bags, of the women, 147—of the men, 161.
Packing chairs, 118.
Paddles, how used, 115.
Palæoliths, their age exaggerated, 40—found along with neoliths, 63.
Peelers, 76.
Pendants, 166.
Pestles, stone, 48.
Petitot on the name "Déné-Dindjié," 9—on copper and iron among Eastern Dénés, 136—on prehistoric weapons, 149—on the dress of the Eastern Dénés, 162.
Petroglyphs, 206.

Philology, its importance as an ethnographical criterion, 21—its bearing on archæology, 32.
Pictographs, 206.
Pilling on the word "Athapaskan," 9.
Pipes, stone, 36.
Plan of the monograph, 6.
Plants, those the economic value of which is not appreciated unnamed, 127—which are eaten by the Western Dénés? 128.
Potlatch, of comparatively recent origin, 125.
Pottery, unknown among the Western Dénés, 35.
Powder pouches, 148.
Powers on the Hupa, 20.
Prehistoric ages not strictly successive, 137.
Prognostications common among the Carriers, 110.
Pubescent girls, their dress, 165—their drinking tubes, 81—their head scratchers, 82—their peculiar observances, 107.
Purgatives, native, 130.

Q.

Quintilian on Language, 21.

R.

Rabbit snares, 103—skins, how utilized, 156, 164.
Rattles, 118.
Red willow, used as wattle, 84—its medical properties, 131.
Rings, 140, 166.
Robe, ceremonial, 179.
Rock inscriptions, 206.
Rose, its medical properties, 132.

S.

Salmon, species of, 73—how caught, 84—how cured, 92—how kept, 49, 196.
Salmon fishing, 84.
Salmon oil, how obtained, 92.
Salmon pits or cellars, 197.
Salmon roe, how prepared, 197.
Salmon weirs, 85.
Sarcees, how they separated from the Beavers, 11—their present habitat, 15—their population one hundred years ago, 29.
Satchets, 146.
Scaffoldings, on the banks of rivers, 91—of the Tsé'kéhne, 197.
Scoops, 156.
Scrapers, stone, 49—how made, 50—bone, for the fat, 68—horn, for the same, 70—hair, 69—cambium, 76.
Sedatives, native, 131.
Semilkameen Indians partly descended from the Tsi|Koh'tin, 24.
Service-berry, how preserved, 125.
Shamans, their head gear, 181.
Shields, 117.
Shushwap Indians, their former relations with the Tsi|Koh'tin, 23.
Signalling in the woods, 210.
Sinkers, rude and uncarved, 36.
Skin tanning, 49, 69, 145.
Skull-crackers, stone, 64.
Slaves, their habitat and numbers, 16.
Sleeping place in the lodge, 187.
Slickstones, 49.
Smoking, originally unknown, 36.
Snares, bear, 99—cariboo, 100—fox, 102—marmot, 103—rabbit, 103—waterfowl, 104—how prepared, 107.
Snaring devices, their details useful, 99.
Snow-shoes, formerly practically unknown among the Carriers, 151—earliest model, 152—modern types, 152—how made, 153—of the children, 154.
Snow shovels, 116.
Snow walking sticks, 155.
Soap-berry, how prepared for eating, 128.
Solutrian-like implements, 63.
Sore eyes, native remedy against, 132.
Southern Dénès, long separated from the Northern Déné, 12—confused ideas as to their ethnographical divisions, 13.
Spear-heads, 62.
Spindles, 114.
Spokeshaves, 144.
Spoons, 76.
Spruce, its shoots used as febrifuge, 130.
Spruce root-weaving, 134.
Steel daggers in prehistoric times, 142.
Stockings, native counterpart of, 165.
Stone implements, in use among historical nations, 42—contemporaneous with copper implements, 137.
Store-houses, 196.
Strings, of the bows, how made, 58—of the snares, how made, 104.
Sturgeon, how caught, 75.
Sûntî, how cooked, 116.
Superstitious observances of the hunters and the women, 106, 165.
Swaddling clothes of the Carrier babes, 133.
Sweat-houses, 197.
Sweet-flag, how eaten, 129.

T.

Tacitus on the arms of the Fenni, 43.
Takhe|ne, wrong readings of their name, 30.
Tanning, how done, 49, 69, 145.

Target disc or wheel, 112—shooting, 113.
Tattooing, 182.
Tattoo marks, 208.
Tcaɟyaɟ, a bark vessel, 122.
Tə'ko', a Carrier game, 112.
Təsĸai, a fishing device, 90.
Thaɟthan Indians, weavers of mountain goat wool, 35.
Théɟmək, how caught, 159.
Thésĸai, a fishing device, 90.
Théssateñ, a fishing implement, 72.
Thomas on mounds, 39.
Throwing-rods or *tətquh*, 111.
Time, means of reckoning, 106.
Tinne, Tinneh, inappropriate as a generic name, 8.
Tlingit, why so named, 10.
Tobacco, originally unknown, 36.
Tolmie & Dawson's map, differing from the actual limits of the Carriers' territory, 26.
Tommy-sticks, 64.
Totems, carved on house posts, 186, 199—their different kinds, 203—how honored, 204—honorific, 204—how assumed, 205—painted on rocks, 207—tattooed on the person, 208.
Totunies, the contradictory readings of their name, 13.
Trapping devices, their details useful to the ethnologist, 98.
Traps, fish, 84—bear, 94—small animal, 96—lynx, 97—marmot, 98—how prepared, 108.
Travelling, formerly difficult in winter, 151.
Travelling marks or signals, 210.
Trays, bark, 123.
Trough-like vessels, 119.
Tsé'kéhne, population, 16—physical characteristics, 17—honest, 19—sociologically considered, 28—subdivisions, 28—bows, 58—bone scrapers, 70—spoons, 76—gambling sticks, 78—how they hunted cariboo in olden times, 100—their names of the months, 106—their utensils, 120—how they trim their beard, 139—their drums, 150—their snow shoes, 154—their lodges, 192—their provision stores, 197.
Tsi|Koh'tin, population 16—physical characteristics, 18—habitat and subdivisions, 22—sociologically considered, 28—bone scrapers, 70—fish harpoons, 71—gambling-sticks, 78—cradles, 133—how they carry their babies, 134—their vessels, 134—their drums, 151—their method of weaving, 156—their dress, 164—their store-houses, 197.
Tunics, of the Carriers, 163.
Tweezers, 138.

U.

Umkwa Indians, their habitat, 16.
Unknown technological objects, 35.
Utensils, of primitive material, 120—description and mode of fabrication, 121.

V.

Villages, 184.
Vowels, unimportant in Déné, 10.

W.

Wailáki Indians, their habitat, 16.
Walking sticks, for the winter, 155.
War, how started, 195.
Wash-tubs, bark, 132.
Waterfowl, how caught formerly, 104—now 105—in China, 105.
Water vessels, 124.
Wattle, 84, 186, 196.
We, a fish-trap, 89.
Weasel, what use made of its skin, 177.
Weaving, 156—of the spruce roots, 134.
Wedges, stone, 47—bone, 75.
Weirs, how constructed, 84.
Western Dénés, the nature of their territory, 11—misconception as to their ethnographical status, 14—classification of the, 30—not maize growing, 36—unæsthetic, 36—brave against wild animals, 94—their dress, 163.
Whistles, ceremonial, 81.
Widow satchels, 146.
Wigs, ceremonial, 173.
Wild goat skins, how treated, 68.
Willow-herb, how eaten, 129.
Windows, none in ancient lodges, 187.
Winter dress, 164.
Winter travelling, difficult, 151.
Woman and the Lynx, the, 108.
Women, their dress not much differing from that of the men, 164.
Wood-peckers, what use made of their feathers, 177.

Y.

Yellow-knives, a Déné tribe; its habitat and population, 16—acquainted with copper in prehitoric times, 136.
Yuta-sĸai, a fish trap, 86.

WORKS QUOTED OR REFERRED TO.

BANDELIER, A. A.—Indians of the Southwestern United States.

BIANCONI, J. A.—Matériaux pour l' Histoire Primitive et Naturelle de l' homme; Toulouse, 1876.

BOAS, F.—Fifth, Sixth and Seventh Reports on the Northwestern Tribes of Canada; B.A.A.S. 1889, 1890, 1891.

The Central Eskimo; Sixth Annual Report of the Bureau of Ethnology; Washington, 1888.

BOYLE, D.—Archæological Report for 1891, Toronto.

BRINTON, D. G.—The American Race; New York, N. D. C. Hodges, 1891.

CALLBREATH, J. C.—Notes on the Tahltan Indians; in Notes on the Indian Tribes of the Yukon District, reprinted from Annual Report Geological Survey of Canada; Ottawa, 1887.

DAWSON, G. M.—Notes on the Shushwap People of British Columbia; Transactions of the Royal Society of Canada, Section II., 1891.

On the Haida Indians of Queen Charlotte Islands; Montreal, 1880.

Report on the Queen Charlotte Islands; Montreal, Dawson Bros., 1880.

DAWSON AND TOLMIE.—Comparative Vocabularies of the Indian Tribes of British Columbia; Montreal, 1884.

FRAAS, O.—Die alten Höhlenbewohner.

FRASER, J. G.—Totemism; Edinburgh, 1887.

GATSCHET, A. S—The Karankawa Indians; Cambridge, Mass., 1891.

The Klamath Indians of Southwestern Oregon; Contributions to North American Ethnology; Washington, 1890.

GUNN, D.—History of Manitoba from the earliest settlement to 1835; Ottawa, 1880.

HALE, H.—Language as a Test of Mental Capacity; Transactions Royal Society of Canada, Sect. II., 1891.

HOLMES, W. H.—A Study of the Textile Art; Sixth Annual Report Bureau of Ethnology; Washington, 1888.

HOUGH, W.—Fire Making Apparatus in the U.S. Museum; Report U.S. Museum, Washington, 1890.

JORDAN, D. S. and GILBERT, CH. H.—Synopsis of the Fishes of North America; Washington, 1882.

LEGAL, E.—Les Indiens dans les plaines de l'Amérique du Nord; Petites Annales, O. M. I., Paris, 1891.

LENORMANT, F.—Die Anfänge Der Cultur, Vol. I.

MACKENZIE, Sir A.—Voyages from Montreal on the River St. Lawrence, through the Continent of North America to the Frozen and Pacific Oceans, in the years 1789 and 1793; London, 1801.

MACKENZIE, A.—Descriptive Notes on certain Implements and Weapons, etc., from Graham Island; Transact. Roy. Soc. Can., Sect. II. 1891.

MASON, O. T.—The Ray Collection from Hupa Reservation, Washington. Anthropology in 1886; Washington.

MATTHEWS, W.—The Mountain Chant; Fifth Annual Report of the Bureau of Ethnology; Washington, 1887.

MORGAN, T. J.—Sixtieth Annual Report of the Commissioner of Indian Affairs; Washington, 1891.

MORICE, A. G.—The Western Dénés, their Manners and Customs; Proceedings of the Canadian Institute, Vol. VII.; Toronto, 1890.

The Dené Languages considered in themselves and incidentally in their relations to non-American Idioms; Transactions Canadian Institute, Vol. I., Toronto, 1891.

Are the Carrier Sociology and Mythology Indigenous or Exotic; Transactions Roy. Soc. Can., Sect. II., 1892.

MURDOCH, J.—Ethnological Results of the Point Barrow Expedition, Ninth Ann. Rep. Bur. Ethnology, Washington, 1892.

NIBLACK, A. P.—The Coast Indians of Southern Alaska and Northern British Columbia; Report U. S. National Museum, 1890.

PETITOT, E.—Monographie des Déné-Dindjié; Paris, Leroux, 1876.

En route pour la Mer Glaciale; Paris, 1888.

Six Légendes Américaines, identifiées à l'Histoire de Moise; Paris, A. Hennuyer, 1877.

Rapport Succinct sur la Geologie des Vallées et de l'Athabaskaw-Mackenzie et de l'Anderson; Paris, A. Hennuyer, 1875.

Appendice relatif aux armes de pierre des Indiens Arctiques; Paris, A. Hennuyer, 1875.

PILLING, J. C.—Bibliography of the Athapaskan Languages; Washington, 1892.

POWELL, J. W.—Indian Linguistic families; Seventh Annual Report Bureau of Ethnology, Washington, 1892.

Third Annual Report Bureau of Ethnology; Washington, 1884.

POWERS, S.—Contributions to North American Ethnology; Vol. II., Washington.

QUINTILIAN—De Institutione oratoria, translated by La Harpe; Dijon, 1820.

ROYCE, C. C.—The Cherokee Nation of Indians; Fifth Annual Report of the Bureau of Ethnology, Washington, 1887.

SOUTHALL—Recent Origin of Man.

THEIN, J.—Christian Anthropology; New York, Benziger Bros., 1892.

THOMAS, C.—Manuscript Troano; Contributions to North American Ethnology, Vol. V., Washington.

Burial Mounds of the Northern Section of the U. S.; Fifth Annual Report Bureau of Ethnology, Washington, 1887.

Work in Mound Exploration of the Bureau of Ethnology, Washington, 1887.

The Problem of the Ohio Mounds, Washington, 1889.

VIGOUROUX, F.—Les Livres Saints vengés, Vol. III.

Dictionnaire de la Bible; Letouzey et Ané; Paris (still in course of publication).

And a few others with which I am not personally acquainted.

ADDENDA ET CORRIGENDA.

Page 25—After paragraph 4 add the following as an additional subdivision :—Hwozahne, two villages, namely, Stony Creek (Sai'kəz), population 88, and Laketown or Nu|kre, population 65, both of which are situated a little south of Fraser Lake.

Page 30—After "Fort George" insert:—Hwozahne, south of Fraser Lake

Page 35—Strike out "the Eskimo" and add :—to which might almost be added the Eskimo, were it not that J. Murdoch (Ethnological Results of the Point Barrow Expedition, Ninth Ann. Rep. Bur. Ethnology, Washington, 1892) states that he obtained from a Point Barrow tribe three fragments of a sort of pottery, the material of which "was said to be earth (nu'na) bear's blood and feathers, and appears to have been baked" (p. 91).

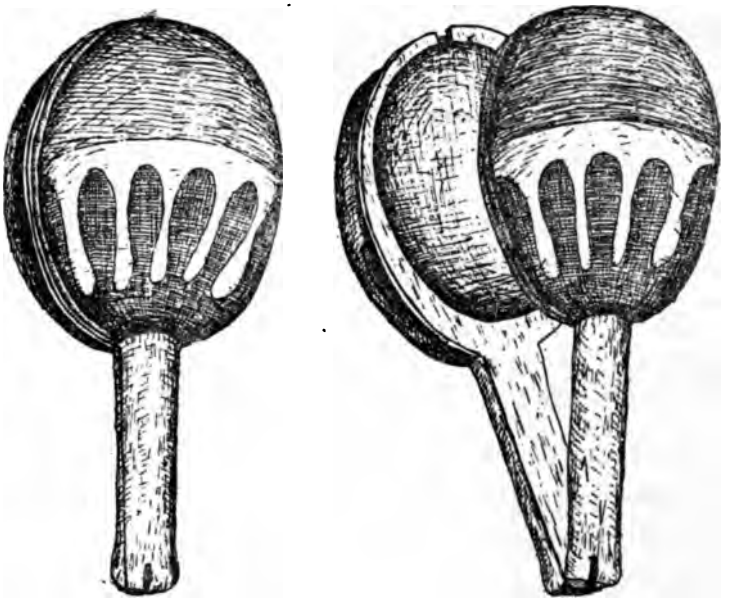


Fig. 199.

Page 118—Dele the whole paragraph beginning "These other objects" and substitute :—Three other objects, which as sociological items were also due to the influence of the maritime tribes, but had become naturalized among, and were made by, the Carriers, were the *nʃrwəs* or medicine-rattle, the *han?'taih*, or ceremonial mask, and the *t'sak*, or long, festival dish. These were almost the only objects of art of genuine Déné manufacture to which I can point, and yet I do not think I unduly depreciate my Indians' artistic capabilities by adding that they were rather below than above the average of similar aboriginal carvings. The appositeness of this remark will become evident by a comparison of fig. 199, wherein we have a representative Carrier medicine-rattle, with illustrations of similar implements so frequently met with in modern essays on the Northwest Coast Indians. As may be seen by the cut *b*, the Déné rattle is made of two hollowed halves bearing some resemblance to wooden dippers. Its material is birch, and its only ornamentation is in paint, not carving. The figure explains the mode of connection of the two parts of the rattle.

The masks were used only by mimics accompanying by grotesque gestures and jerkings of the head the dance of a privileged few; but the rattles served a double purpose: they did service in connection with a notable's dance, being then held in the hand by the dancing personage himself, and also as an accompaniment to the incantations of the *tɔyɔn* or shaman. No ceremonial masks of genuinely Déné make are now available for illustration: but such objects are, even at the present day, so common among the natives of the Pacific Coast that they hardly need any description. It may suffice to refer the reader unacquainted with North American aboriginal paraphernalia to the plates or figures illustrating. . . .

Page 181—After "their occult art" insert:—Let me add that some of these head-dresses, while retaining the name of *cyas-krei*, were composed of beaver-teeth, sometimes daubed with red ochre. One such specimen recently came into my possession which lacks the double row of dentalium shells usual with crowns made of real bear's claws.

SESSION 1892-93.

FIRST MEETING.

First Meeting, 5th November, 1892, the President in the chair.

Letters were read from the American Society of Civil Engineers and from the United States Weather Bureau.

Donations and Exchanges since last meeting, 1552.

The following were elected members: — Miss Marcella Wilkes, W. H. Marcon, Dr. Oronhyatekha, R. H. Bowes, W. Morrison.

The following gentlemen were, on the recommendation of Council, elected corresponding members for three years:—R. G. Haliburton, Q.C., F.R.G.S., Dr. T. W. Beemer, Rev. A. G. Morice, O.M.I.

The following motions were passed :—

Moved by J. C. Hamilton, seconded by Prof. Macallum :—

"That this Institute recognizes with very sincere regret the great loss it has sustained since its last session in the death of four of its honoured members: — His Honour Sir Alexander Campbell, K.C M.G., Sir Daniel Wilson, LL.D., D. A. O'Sullivan, LL.D., Q.C., and Nelson G. Bigelow, M.A, LL.D., Q.C., M.P.P., and that a minute of this resolution be entered in the Transactions of the Institute."

Moved by Dr. Kennedy, seconded by Alan Macdougall :—

"We, the members of the Canadian Institute, ask to be permitted to add our tribute of respectful regret and sorrow on the loss sustained by our province in the death of Sir Daniel Wilson. For over thirty-eight years a member of the Institute, he took a deep interest in its progress, enriching its Transactions by numerous contributions of his talented pen. Elected President in 1859, he for many years afterwards remained a constant and warm friend till in 1884, as a tribute to his interest in our work and a respectful recognition of his labours in Literature, Archaeology, and Ethnology, he was elected an honorary member, the highest distinction the Institute could confer upon him. The Institute at this its first meeting after his death records its appreciation of the services rendered by Sir Daniel Wilson, mourns for the loss it has sustained, and conveys to his family its respectful expression of sympathy in their great and deep affliction."

Moved by Prof. Macallum, seconded by James Bain, Jr. :—

"The Council and members of the Canadian Institute desire to tender to Professor Loudon their congratulations on his appointment to the Presidency of the University of Toronto, and to express the hope that he may long live to occupy the position for which he is so well qualified. They rejoice to see in this appointment of a former President of this Institute to the highest office in the Provincial University, a tribute to the character of the scientific work done by the Institute and an augury of a continuation of the close relations which should exist between the two leading scientific bodies in the province."

Mr. J. W. L. Forster then presented to the Institute a portrait of Sandford Fleming, LL.D., C.M.G., which was acknowledged by the President.

Mr. Forster, in handing the portrait to the President and members, said :—

"Sirs,—There are not many ways in which I can directly advance the scientific departments of the Institute, but this task was undertaken with the hope that in some way it would serve to encourage and deepen the interest in the work you are doing. I was moved to the act also because of my humble opinion no one better deserves this recognition at your hands than the subject of the picture in view of his services in the past and present relationship to the Institute, and I was prompted to this by the knowledge that what is mortal of men will vanish from our sight, and there are men whose memory is worthy of being cherished. The hope is indulged in that this portrait will by this service be prized for generations to come.

The President said in reply :—

"There are jewels that we must provide with a suitable setting, and the hope is renewed that a suitable home shall soon be secured for the Institute, and that this portrait will be one of its chief ornaments. Not only is this a liberal gift from the artist, but a tribute to science from the fine arts. The Institute will jealously guard this treasure, which is a worthy tribute to its most distinguished living member."

The Secretary read a letter from Dr. Sandford Fleming, in which he regretted his unavoidable absence, and warmly acknowledged the honour conferred upon him. The letter contained some interesting reminiscences of his early connection with the Institute, and of those

associated with him in its foundation. After sketching the history of the Institute since that time, he adds :—

"I have touched on the place which the Canadian Institute has attained among modern scientific societies. The Institute is quietly and unobtrusively gaining for itself an honourable name. The work is intimately associated with the life and progress of the Dominion, and as the years come and go it will, I confidently believe, do its part in promoting the purposes of science in inaugurating needed reforms, and in advancing the best interests of society."

SECOND MEETING.

Second Meeting, 12th November, 1892, the Vice-President in the chair.

Letters were read from the Prisoners' Aid Association, and the Chicago Historical Society.

Messrs. Arthur B. Willmott and Charles B. Miller were elected members.

Donations and Exchanges, 81.

The following resolution was moved by Mr. G. Kennedy, LL.D., seconded by Mr. G. G. Pursey, and unanimously adopted :—

"In accepting from Mr. Forster his magnificent gift of a portrait of our distinguished honorary member, Mr. Sandford Fleming, C.E., LL.D., C.M.G., etc., the members of the Canadian Institute desire to express their appreciation of the unselfish devotion to art and the interest in the Institute which have prompted Mr. Forster to this generous act, and they hereby tender to him their sincere gratitude for so fine a specimen of his handiwork, which will, they trust, hand down to future generations the counterfeit presentment of one who so deservedly holds a high place in the respect not merely of the members of the Institute, but of the entire Dominion of Canada."

A. Hamilton, M.A., M.D., read a paper on the "Physiology of the Lips in Speech," of which the following is a synopsis :—

The functions, or physiology, of the lips in speech are chiefly (1) to modify vowels by the shape assumed ; (2) form the consonants called labial. The labial effect on vowels has been called "rounding." In what this consists has not been stated anywhere definitely and lucidly. To a less extent this is true of consonants. To give a lucid and true statement of lip-function is the object of the paper. It simplifies matters

to slightly notice the many muscles of the face required to express the emotions and perform other vital acts and concentrate attention on (1) the orbicularis oris, that purse-string muscle which surrounds the mouth by its action and produces the *o*-family of vowels par excellence ; (2) the elevators of the upper and lower lips, causing their protrusion, producing the *u*-family of vowels. In *o*-vowels purse-string contraction or true "rounding" prevails; in *u*-vowels, protrusion. A marked parallel obtains between the orbicularis muscle surrounding the eye, shutting the lids and throwing the skin into transverse wrinkles. The elevator of the upper lid is analogous in function to the elevator of the upper lip. The Roman alphabet is an admirable one for annotating vowel sounds, because it divides the vocal scale into five grades, which (in descending pitch) are *i, e, a, o, u*. In English we appear to have developed open *o* into a new primary vowel, making *i, e, a, o, o, u*, as heard respectively in machine, vein, art, law, no, truth. It is remarkable that we in Canada should be so slow to adopt Roman or Continental pronunciation of Latin, while it is taught everywhere else, even in the seats of learning in conservative Britain—a reflection on our educationists which they should not be slow to rectify, unless willing to lag behind the age. The *o*-family of vowels, or those in which circular contraction is exclusive or predominant, was then taken up seriatim in English (standard and dialectic) and some chief forms in French and German. Then the *u*-family, in which protrusion prevails, was treated. The regular labial consonants *f, v, p, b, m*, were then explained as to their formation, as were also Spanish *b*, German *w*, Japanese and Hungarian *v*, Greek *b*, and *ph*, and the two consonants beginning the French words *oui* and *huile*.

THIRD MEETING.

Third Meeting, 19th March, 1892, the President in the chair.

Dr. Meredith and Messrs. Pearce and McCrossen were elected delegates to the Prison Reform Conference.

Donations and Exchanges, 70.

Prof. L. E. Horning was elected a member.

A paper by Rev. John McLean, M.A., Ph.D., on the "Social Organization of the Blackfoot Indians" was read by Mr. Alan Macdougall, C.E.

A paper by H. R. Wood, M.A., entitled, "Contributions to Canadian Mineralogy," was read by Mr. G. Kennedy, LL.D. This short paper

had particular reference to some crystals of corundum and its gem variety sapphire. They were collected with a number of other minerals at the base of the Laurentian range in the vicinity of Papineau creek, in the township of Carlow. The sapphire was found along the banks of the Yak river, weathered out from a grey granite. It has been stated by Dr. Hoffmàn, in notes of minerals occurring in Canada, that corundum has only been found in the township of Burgess, Lanark county, Ontario.

FOURTH MEETING.

Fourth Meeting, 26th March, 1892, the President in the chair.

The President, Dr. Clark, and Messrs. Pursey and L. J. Clark were appointed delegates to attend the Conferenee on Social Problems, on 9th and 10th December.

Donations and Exchanges, 48.

Dr. Daniel Clark read a paper on "The Brain as the Organ of the Mind." He gave illustrations on the blackboard of the exceptional arrangement in the brain of the blood circulation, and how this differed from the system in other parts of the body. He gave the apparent reasons for this anomalous construction. He described the various structures of the substance of the brain and their functions in the organism, especially as media of sensation and volition. He gave illustrations of how impressions produced on the brain are always retained, and how valuable this law is in memory. The functions of all the bodily cells were related—each according to its kind—and more especially the varied work of brain cells in all mental phenomena. The cells were the ultimate physical organisms in relation to mind operations. Brain power was determined by their number more than by brain weight. A small brain well equipped had more tone and energy in it than a large brain not thus endowed. The absolute weight and the relative weight to that of the body were not safe guides to determine brain power. The different definitions of mind were discussed, that of the theologian, that of the metaphysician, and that of the physiologist. The battle of schools raged more over definitions than over facts, as was usually the case. The localization of brain function, according to the modern schools of Fevrier, of Charcot, of Richet, and of Campanini, were explained, as was also the recently published theory of the German Wiessman in antagonism to the theory of Darwin in respect to the hereditary transmission of acquired character.

FIFTH MEETING.

Fifth Meeting, 3rd December, 1892, the President in the chair.

Donations and Exchanges, 154; also to the Biological Section, 107 bird-skins, by Dr. Walker, of Orillia.

Miss Sarah A. Flood and Mr. C. H. Keefer, C.E., were elected members.

The Secretary, for Professor Campbell, of Montreal, read a paper on "A New Reading of the Buddhist Inscriptions of India."

Mr. Andrew Elvins read a paper on "The Planet Jupiter and his Satellites." He stated that the discovery of a fifth satellite to Jupiter has caused astronomers to turn their attention to the giant planet of our system, and many who have not made astronomy a special study are more interested in Jupiter's system than they have usually been in the past. Four moons have been known since Galileo's time, and they have been so easily seen that no one has appeared to suspect that any other existed—at least until about two years ago. When we speak, now, however, of the moons of Jupiter we know there are five, and we suspect there may be more. Their distances from the planet's centre, expressed in radii of the planet, are as follows:—

RADII.		MILES.
V.	2½	112,000
1.	6	267,000
2.	9	425,000
3.	15	678,000
4.	24	1,192,000

It will be observed that by adding the distance of the inner satellite to the next in order, we get the distance of the next, and so on throughout the series. He thought this could not be a matter of chance, but he was not able to point out the cause. The rates of the satellites in their orbits have also a peculiar feature, the most distant one, the IV., moves but half as fast as the one next inside itself, and so on throughout the series. The velocity of No. IV. is one mile per second.

NO.	MILES.
III	2
II	4
I	8
V	16

He left these facts with his hearers and requested them to seek the cause. In relation to the shape of the satellites he thought that the strong tidal action of the mighty planet would be so great that they

would be drawn out into ellipses. Secchi, Daws, and the Lick observers have seen them occasionally of this form. Satellite I. has been sometimes seen apparently double, more light being reflected from near the ends than at the centre of the ellipse.

Mr. Elvins referred to many observations of satellites, when near the limb of Jupiter, having been seen to disappear and reappear, etc. He explained this by supposing the light to undergo refraction in passing through gaseous matter recently thrown from the planet and moving in orbits near the primary. He thought it probable that all the satellites were originally thrown from the planets by the combined action of the tangential force caused by the planets' rotation, the molecular motion of the gases in the atmosphere of the planet, and by projected matter thrown from the Jovian volcanoes into space.

SIXTH MEETING.

Sixth Meeting, 10th December, 1892, the President in the chair.

Donations and Exchanges, 58.

Dr. A. F. Chamberlain was appointed delegate to attend the meeting of the American Folk-Lore Society, at Boston, on the 28th December.

The following were elected members: Prof. James Mavor, W. H. P. Clement and Joseph Antisell Allen.

Mr. A. F. Hunter, M.A., read a paper on "British Immigration into Upper Canada, 1825-1837." The population of Upper Canada at the close of the war of 1812–14 was less than 100,000. This had increased fourfold by the time of the outbreak of the rebellion of 1837, the increase having been chiefly due to British immigration. Amongst the causes that produced this rapid influx of immigrants during the period were these:—1. Attention in Britain was turned towards Upper Canada by many books of travel, the writers of which visited the country and published their travels on returning home. No other period has yielded so much literature relating to the country and its resources. 2. The free grant land policy was adopted here at an earlier date than in some of the States. Besides this, an order-in-council in 1818, imposing settlement duties on the U. E. Loyalists, militia, discharged officers and soldiers, pensioners, and all others receiving free grant lands after that date, had the effect of preventing them from holding land on speculation, and thus stimulated settlement. 3. At the passage of the Catholic Emancipation bill in 1829, despondency fell upon the Irish Protestant

peasantry of Ulster, and large numbers of them emigrated. 4. The slavery agitation in 1832 had previously produced in Britain a feeling of hostility to the West Indies, and one of favourable regard for Upper Canada, where slavery had been abolished in 1793. 5. The industrial agitations from 1818 till 1834, including Chartist riots, besides radical and anti-radical risings, forced large numbers to emigrate from the industrial centres of Glasgow and Manchester. 6. The cholera in 1832. Instances were cited of settlements formed in this province by these causes. The immigrants chiefly settled in groups, according to their nationalities, each group giving to the district it occupies the political and social features that still cling there, though it can be observed that modern methods of communication and travel are fusing the different races into a distinct Canadian nation.

Mr. Hunter also read a paper on "The Site of the Mission of Ste. Marie on the Wye; Its Possessors and Present Condition." In this paper Mr. Hunter deplored the lack of attention paid generally to historic ruins in Canada, and in particular to this old French fort of 1639 in the County of Simcoe, which is now in a neglected condition. Two years ago Mr. Boyle had suggested in his annual report that steps be taken to buy the land around the place for the use of the public, and erect a tablet setting forth in a few words the history of the spot. Hitherto, however, nothing had been done in the direction proposed. The paper gave an account of the present ownership of the site, as it is recorded in the Registry Office of the County of Simcoe at Barrie. For nearly fifty years a part of the land, on account of its associations with the early Jesuit missionaries, has been in the possession of priests of that order. The condition of the ruins has greatly changed since Europeans first settled in the neighbourhood. An account of the place, written by Rev. Felix Martin, who visited it in 1845, was read to illustrate its former condition. This is probably the earliest of modern accounts, and from it the walls are known to have been much higher then than now. As the duty of guarding the place from even further destruction belongs to the French of Quebec Province as well as to the people of Ontario, it was suggested that an appeal be made to the Governments, Dominion or Provincial, to make some provision for its preservation.

SEVENTH MEETING.

Seventh Meeting, 17th December, 1892, the President in the chair.

Mr. J. C. Hamilton was appointed a second delegate to attend the meeting of the American Folk-Lore Society.

Donations and Exchanges, 66.

Dr. Sandford Fleming read a paper on "Ocean Steam Navigation."

The following resolution was moved by Dr. Fleming, seconded by Mr. Kivas Tully, and adopted :—

"Resolved, That the subject of the 'Pioneer Ocean Steamship' having been brought to the consideration of the Canadian Institute at its meeting held in Toronto on Saturday, December 17th, 1892, it is resolved that suitable measures be taken to establish a memorial tablet in honour of the men associated with the building and sending to sea of the Royal William, in August, 1833, and that the members for the city of Toronto be requested to obtain permission for the tablet to be placed in a fit position in the Parliament buildings at Ottawa; and that it be remitted to the Council to invite the co-operation of societies or individuals, and to take such other means as may be needful, to carry out in the best manner the spirit of this resolution."

Dr. Fleming also read a paper on "Early Steamboats," after which the following resolution was adopted :—

"Resolved, That the matter of the first steamboat constructed in Canada be remitted to the Council, with the request that they will consider the propriety of dealing with it in a similar manner to that set forth in the resolution passed by the Institute to-day with respect to the Royal William."

Dr. Fleming then read a paper on "Postage Stamps," when on motion by Mr. W. H. Merritt, seconded by Mr. J. C. Hamilton, it was

"Resolved, That the Institute having heard with great pleasure the paper read by Dr. Fleming on 'Postage Stamps,' requests the Council to take into their earnest consideration the points suggested by the paper."

EIGHTH MEETING.

Eighth Meeting, 7th January, 1893, the President in the chair.

Donations and Exchanges, 133.

W. H. Brouse and F. A. Fleming were elected members.

A report was read from Dr. A. F. Chamberlain, delegate from the Institute to the annual meeting of the American Folk-Lore Society, held at Boston, December 28th and 29th, 1892. The report stated that the

meeting was very successful and well attended by members from the United States and Canada. Five of the papers read were contributed by Canadians, and among the officers elected for next year three were Canadians, the President being Mr. Horatio Hale, of Clinton, Ont., justly celebrated for his distinguished attainments in philology, anthropology, folk-lore, and kindred subjects. The next meeting of the society will be held in Montreal.

An announcement was read from the Committee on Communications of the Anthropological Society of Washington, giving a statement of the objects of that society and its programme for the current year.

Mr. James Bain, Jr., then read on behalf of Captain Ernest Cruikshank, of Fort Erie, a paper on "Captain Walter Butler and the journal of his voyage along the north shore of Lake Ontario in 1779."

The journal was accompanied by a memoir of Butler by Capt. Cruikshank, in which his military career was traced from the beginning of the American revolution until his death in battle in the autumn of 1781.

After the reading of Capt. Cruikshank's paper Mr. Bain read, by way of appendix, some extracts from the journal of Major Robert Rogers along the north shore of Lake Ontario in 1760. In the part of the journal in which he relates his visit to Toronto, as the river and old French fort were then called, Major Rogers makes the remark, "I think Toronto a most convenient place for a factory, and that from thence we may very easily settle the north side of Lake Erie."

NINTH MEETING.

Ninth Meeting, 14th January, 1893, the President in the chair.

Donations and Exchanges, 45.

Mr. Emerson Coatsworth, Jr., M.P., was elected a member.

Mr. J. C. Hamilton, LL.B., read a paper entitled, "The Algonquins of the Georgian Bay; Assikinack, a Warrior of the Odahwas," of which the following is a summary :—

Mr. Hamilton showed from statistics furnished by the Indian Department that the number of Indians of Ontario and Quebec was in 1891 about 26,600, and that they have increased by 25 per cent. in the preceding 25 years. The aborigines of the Georgian Bay district are of Algonquin tribes, Ojibewas, Ottawas, Mississagas, and Pottawatamies. The population of the Northern Ontario superintendency was in 1886, 3,343.

They held 3,120 acres under cultivation. Their crops were 4,269 bushels of grain and 1,300 tons of hay. The fish taken by them were valued at $18,500 and furs at $5,205, and their revenue from other sources was $5,850. The charter under which the Canadian Indians claim their rights is the Royal proclamation of King George III. in 1763, after the Treaty of Paris. Their lands were to be alienated only at public meetings presided over by the governor or his deputy. Care and control over them is exercised by the Dominion Government. The Algonquins of Lake Huron and Georgian Bay are divided into fifteen bands, settled on as many reserves on the shores of lake and bay. Most of them are now Christians, but a remnant of the old superstition is often found lingering among them. They meet yearly on a chosen place to dance and shoot Matci Manito, the evil spirit. They live in tribes, the regulation of their affairs being in the hands of councils chosen by themselves; the oldest system of government on the continent is in operation in their council houses. Their code of rules, when adopted and approved by the Governor-General, forms an excellent quasi-municipal system, including the management of roads, fences, schools, and pounds. They exhibit laudable interest in education and have many Public schools, and also send many of the children to the Roman Catholic schools and convent at Wikwemikong, on Manitoulin Island, and to the Protestant Shingwauk and Wawanosh Homes at the Sault Ste. Marie. Mr. Hamilton then gave an interesting account of several famous Indians of this region; of Chingalacose, the Small Pine, the noted Chippewa chief who aided Capt. Roberts in taking Fort Mackinack in 1812, and was afterwards for many years leader of his tribe in their wars with the Sioux, but was converted to Christianity under the ministration of Rev. Dr. McMurray when missionary at Sault Ste. Marie. His son, Augustine Shingwauk, gave his name and aid to the Home there established for the education of Indian children. Assikinack was a noted Ottawa chief, and under the name of the "Black Bird" figured at the taking of Fort Dearborn in 1812, and in the defence of Mackinack from American attack in 1814

His son Francis was, in 1840, when a lad, brought to Upper Canada College, where he developed good scholarly powers, and attained high places in his classes. He became Indian interpreter to the department, and in 1858 and 1859 read several learned papers before the Canadian Institute as to Indian history and customs. He unfortunately died in 1863. Mr. Hamilton then discussed the "Manaboyho" legends, and showed that these, as found in various forms among our Algonquins, are the substance of the "Song of Hiawatha," which latter name is the Onondaga or Iroquois name for the same demigod or national hero. Several

places along our north shore still retain the name of Manaboyho or Nakibozhu, among these an island in Michipicotin Bay, which is his fabled burial place. Mr. Longfellow lays the plot of his song on the south shore of Lake Superior, but the Chippewas, Ottawas, and many other of the nations named, and the customs and lore described, relate quite as much to the Algonquins of our north shores. The paper concluded by giving abstracts of a few interesting myths, or legends, related by young Assikinack when in Toronto, and which he had learned from his father and other learned men of his nation on the Great Manitoulin Island, where the brave old warrior and his talented son lie now side by side in their last resting place at Wikwemikong.

TENTH MEETING.

Tenth Meeting, 21st January, 1893, the President in the chair.

Donations and Exchanges, 93.

A communication was read from the Royal Academy of Sciences of Turin respecting the ninth Bressa prize, to which, according to the testator's will, scientific men and inventors of all nations will be admitted. A prize will be given to the scientific author or inventor, whatever be his nationality, who during the years 1891-94, "according to the judgment of the Royal Academy of Sciences of Turin, shall have made the most important and useful discovery, or published the most valuable work on physical and experimental science, natural history, mathematics, chemistry, physiology, and pathology, as well as geology, history, geography, and statistics." The sum fixed for the prize, deducting the income tax, will be 10,416 francs.

Mr. Edward Meek read a paper entitled "Lessons from the Times and Teachings of Cicero." The lessons drawn from the times were "political" —using the word in a general sense—teaching the causes which contributed to produce the condition of the Roman Commonwealth as it existed in the age of Cicero, its subsequent dissolution, the overthrow of democratic government, and the establishment of imperial military rule. As war was the chief business of the nation, the successful generals became the greatest men—the popular idols. The people gradually turned their attention, and transferred their allegiance from the Senate and magistrates, to the generals of the armies. The Senate, from the foregoing and other causes, lost its control of the popular mind and over the popular leaders. These leaders began to contend with each other for

the mastery. The strongest and most fortunate ultimately became supreme. Julius Caesar was thus produced and the old constitution and senatorial supremacy expired. The second part of the paper was devoted to "Lessons from the Teachings of Cicero," quoted largely from those writings of Cicero which teach and discuss the moral duties.

ELEVENTH MEETING.

Eleventh Meeting, 28th January, 1893, the President in the chair.

Donations and Exchanges, 33.

Mr. Alan Macdougall, C.E., and Mr. James Bain, Jr., were appointed representatives on the Board of the Industrial Exhibition Association.

Rev. Philip Tocque, A.M., read a paper on "The Great Fires of St. John's, Newfoundland, from 1816."

TWELFTH MEETING.

Twelfth Meeting, 4th February, 1893, the President in the chair.

Donations and Exchanges, 53.

R. N. Wilson, of Fort McLeod, Alberta, was elected a member.

Mr. W. A. Sherwood read a paper on "Hindrances to American Art." He said there could be no phase of art thought more difficult to grasp than that which fell to his lot that evening to discourse upon. Long before the revolution, to the very foundation of colonial life, might well be traced the fundamental basis of "Hindrances to American Art." The Puritans, justly indignant at the licentious character of the English court, carried their dislike to the utmost verge of practice. Painting, royally encouraged in the palace of the Stuarts, fell a victim, like many sister arts, to the contempt of the new colonists. Their homes and places of worship were absolutely free from every kind of decoration. Thus, through a whole century we could pass without any advancement along the line of art. Indeed, the only semblance to adornment was to be found in the basket work painted by the aborigines. In the next century the same condition continued to exist, although, indeed, marked by the birth of Benjamin West. Those of them who were familiar with the biography of early American painters had but to recall that amusing incident of West appearing before the fathers of the Church to answer

for his conduct. After much prayer and pleading young West was permitted to practise his art, yet from the indifference and lack of patronage he, who might have laid the foundation of American art, was forced to make a royal retreat and find his home in England. The dawn of the Republic was characterized by no art movement. From the great tide of immigration one would expect at the time an absolute change of front, but what were the conditions of to-day, and what were the causes? A brief analysis, he thought, would suffice. The German immigrant, for instance, though rapidly adopting new political principles, still cherished fondly the early impressions made upon him in his native land. Industrious, toiling, of thrifty habits, he soon acquired a fair amount of wealth. The children visited the home of their fathers, and the great art galleries of their old land became all in all to them. They returned deeply impressed with a love for pure German art; nothing American in art for them. The same may be justly said of the descendants of every nationality. From such a condition what hope to evolve an American art? The art of the nation ought to reflect the thought of the nation, being in touch with the varying phases of light and shade through which the nation is passing. The art of mediæval times formed a great chapter in the book of history, and gave an insight into the mode of thought which engrossed the middle ages. It was purely European, inferior to the work of later centuries, yet invaluable from its native and primitive character. It was historical. If Canadians hoped to have a native art they must insist upon treating it from some national point of view. Then as the centuries passed a distinctive character would unfold itself, embodying and marking and reflecting the thought of the people in its varied development. While the thought expressed by speech and writing lives long, it does not survive that represented and expressed on polished marble, imperishable fresco, and the canvas on which genius has imprinted its sublime ideals. Art is the great conservator of thought. It lives and shines forth in its might when books are forgotten and the names of earth's great writers are become obscure. This is an age of light. The dim lighted cathedral is a thing of the past, the dread wizard of the cave has been transformed into an angel of light, and the magic wand into a sceptre of righteousness. It is an age electric. Art should reflect it—brilliant, varying with every phase of thought, and without any trace so far as subject is concerned of foreign thought.

THIRTEENTH MEETING.

Thirteenth Meeting, 11th February, 1893, the President in the chair.

The following Note on the life and works of M. l'Abbè Provancher, by Julie Julien, was read :—Mr. l'Abbè Leon Provancher was born in Becancourt, near Three Rivers, on the 10th of March, 1820. He was ordained priest at Quebec on the 12th of September, 1844. Since 1862 he has devoted all his time to the study of natural history. He began then the publication of the "Naturaliste Canadien." His principal works are: "Traite èlèmentaire de Botanique," illustrated, 1858; "Flore du Canada," 1862; Le "Verger," "Potager," et le "Parterre," 1874; Faune Entomologique du Canada, Les Coleoptaires, 1877, avec supplements, Ortopteres, Neuroptères, Hymenoptères, 1883; Additions aux Hymenoptères, 1889; Les Hémiptères, 1889. He also published accounts of his travels: "De Quebec à Jerusalem," 1884; "Une Excursion aux pays Tropicaux," "Abrégé de l'Histoire du Canada," 1884; "Les Mollusques de la Province de Quebec," "Les Univalves." He began writing a study on the "Culture of Ornamental Plants," but unfortunately could not terminate his work before his death, that occurred on the 23rd March, 1892, deeply regretted by his sorrowful relatives and by all the lovers of natural history.

Professor Coleman read a paper on "New Trails in the Rockies from the Saskatchewan to the Arthabasca."

Dr. Sandford Fleming read a paper on "The Abolition of the Astronomical Day," also a paper on "A Memorable Epoch in Canadian History," also a paper on "Canadian Historical Pictures."

The following resolutions were passed :—

That the Canadian Institute heartily welcomes and accepts the proffered aid of the Astronomical and Physical Society of Toronto in its work of Time Reform, and requests the Council of the Institute to appoint a committee of three to co-operate with a similar committee of the Astronomical and Physical Society in bringing about the assimilation of astronomical and civil time. The Canadian Institute suggests that the two committees act as a joint committee with equal voting power, and further, that Sandford Fleming, Esq., C.M.G., LL.D., etc., who is a member of both societies, be chairman of the joint committee, with power to decide any difference of opinion which may arise.

That Dr. Fleming's paper on Canadian Historical Pictures be referred to a committee consisting of Messrs. Howland, Forster, Sherwood, Tully and Hamilton, to consider and report to the Council at its next meeting

some plan whereby the proposals mentioned in the paper may be accomplished. That it be an instruction to the Committee on Canadian Historical Pictures to consider the best manner of raising means to obtain a historical painting to commemorate the arrival of Sir Alexander MacKenzie on the Pacific Coast on July 22nd, 1793, after his memorable discoveries and the completion of the first transcontinental journey by any civilized man, and it be suggested to the committee that artists should be invited to submit proposals to the Institute on the 22nd July next.

FOURTEENTH MEETING.

Fourteenth Meeting, 18th February, 1893, the President in the chair.

An interim report from the Committee on Historical Pictures was read.

Donations and Exchanges, 56.

G. M. M. Martin was elected a member.

Mr. L. J. Clark read a paper on "The Breaking of the Conduit," illustrated by drawings on the blackboard.

FIFTEENTH MEETING.

Fifteenth Meeting, 25th February, 1893, the President in the chair.

Donations and Exchanges, 77.

T. Mower Martin, R.C.A., was elected a member.

A paper by Capt. Ernest Cruikshank was read on "Traders and Trade Routes in Canada, 1760-1800" (second paper).

SIXTEENTH MEETING.

Sixteenth Meeting, 4th March, 1893, the President in the chair.

Donations and Exchanges, 70.

E. Herbert Adams, M.D., was elected a member.

The following resolutions were passed:—

That clause 2 of the first section of the by-laws be hereby suspended, and that the Council be requested forthwith to make a selection of ladies

and gentlemen whose co-operation in the work of the Institute is desirable, and to send to them a circular letter explaining its aims and needs, following the same by personal application, paying for such services in the premises according to such a scale as they may see fit, and commissioning such persons as they may appoint to receive the fees and such donations for specific purposes as may be given; the work to be continuously followed up, and reports of progress to be made as often as possible.

That the thanks of the Institute be given to Lt.-Col. F. C. Denison, M. P., for the interest he has taken and the work he has achieved in moving the government to take steps to protect and preserve the old French stone magazine in Fort George, Niagara.

Mr. Andrew Elvins read a paper on "The Satellites of Jupiter."

Dr. A. M. Rosebrugh read a paper on "The Child Problem."

SEVENTEENTH MEETING.

Seventeenth Meeting, 11th March, 1893, the President in the chair.

Donations and Exchanges, 32.

Hon. G. W. Ross was elected an honorary member, Dr. Eden Walker, of New Westminster, B.C., a corresponding member for a period of three years, and Mr. W. Spry, C.E., P.L.S., of Toronto, an associate member.

The Secretary was instructed to send a congratulatory letter to the Lundy's Lane Historical Society on the recovery of the parish records of the parish of Welland from 1820 to 1835, and to ask for a short description of their contents, and where and how the records were found.

Mr. J. W. L. Forster read a paper on "Artists—their Educational Privileges and Professional Rights." He directed attention to the good fortune of the artisan and agriculturist, who each enjoyed technical and scientific education, to the culture given the architect, engineer, solicitor, and practitioner, and asked:—Shall the skilful and distinguished practice of art forever limit itself to the studio and the field? Shall it not allow itself, shall it not prepare itself, to mingle and associate with scholarship in a congenial and eminent fellowship? In close kinship to this question was another:—Shall not art in its approved pursuit have an acknowledged place amongst the learned and honourable professions? These questions formed the text, so to speak, of his paper. He pleaded in the interest of the latter question reliable expert evidence in courts of law,

and the saving of great cost to litigants and to the country, etc. The greater part of the paper was devoted to the educational question, in discussing which he quoted what is being done in France and Belgium, where the machinery of governments and the faculties of the universities are utilized to carry forward broad and thorough systems of instruction, and where examinations are so directed as to give artists an intellectual standing appropriate with the place art holds amongst the liberal professions. Neither the intention nor the effect has ever been to draw away the mind of the artist from his chalk and models; but by so enriching his mind with the stores of information that apply directly to his work, by uncovering to him the wells of scientific truth that will correct his judgment and give permanence to his work, by unrolling the scrolls of history, and by teaching to him the ethics of art equip him for high achievement and honourable renown. The list of options for college and university course for artists was then sketched. And the course for fine art degrees in several American universities was given as taking up only a small portion of work that was of real value, and for which the machinery of our university is already fairly well adjusted Ontario does not generally wait for her neighbours to lead, especially in the field of education.

EIGHTEENTH MEETING.

Eighteenth Meeting, 18th March, 1893, the President in the chair.

Donations and Exchanges, 80.

A letter was read from Rev. Canon Bull, President of the Lundy's Lane Historical Society, giving an interesting account of the recent discovery of an old church register at Chippewa, together with many important papers. The reverend gentleman is now endeavouring to make a duplicate of this register, and also to write out the papers in order. An important marriage license, with clergyman's endorsation of Nov. 28, 1839, has been found, of which there was no entry in the parish register. This document appears to be of very great value, as it supplies evidence for which long enquiry had been made.

A paper by Dr. Sandford Fleming on "Early Ocean Steamships" was read. It confuted the statements made by Professor Watkins, in the report of the United States National Museums for 1890, in regard to the claims of the Savannah to be the first steamship to cross the Atlantic.

Mr. Alan Macdougall read a paper on "Electro-Horticulture." He stated he had watched shade trees in a number of streets in early spring

and in the fall, and could find no forcing effect from the electric light Trees away from the lights seemed earlier: north and south streets were earlier than those running east and west. The subject had been under study at Cornell University for the past three years. The reports say the naked light when placed near plants injures them; a clear glass, even a pane of glass, is beneficial, and opal globes give best results. Plants which are much injured under a naked light may be benefited under a protected one. As a rule, plants under the electric light in forcing houses mature earlier than in the dark house. Lettuce can be hastened from seven to ten days by only five hours of light per night. Radishes, beets, spinach, cauliflower are slightly benefited. Certain kinds of flowers are also benefited, and plants which are benefited seem to grow more rapidly during the customary period. The researches point to a likelihood of electric light being advantageous for forcing plants for the market.

Mr. D. W. Beadle, B.A., LL.B., read a paper on "Danger menacing our Pear Orchards from an invasion of Psylla Pyricola."

NINETEENTH MEETING.

Nineteenth Meeting, 25th March, 1893, the President in the chair.

Donations and Exchanges, 46.

Messrs. J. G. Ridout and E. B. Lefroy were appointed auditors.

Mr. William Houston, M.A., read a paper on "The Laurentian Region of Ontario." After discussing the extent of the region, its physical character, geological and geographical features, and resources, he showed its unsuitability for agricultural purposes, and advocated setting it aside as a great national park.

He concluded by making the following suggestions:—

1. All free granting of land within that region should be at once and forever abandoned.

2. Some policy should be adopted with a view to securing the reinvestment of abandoned lands in the Crown.

3. So soon as they are reacquired steps should be taken to have them reforested.

4. Additional measures should be taken to secure the preservation of game.

5. The Legislature should exercise some control over the waste caused by destructive lumbering operations.

6. Access to the interior of the region should be facilitated.

TWENTIETH MEETING.

Twentieth Meeting, 1st April, 1893, the President in the chair.

Donations and Exchanges, 71.

Dr. Henry Hunt was elected a member.

A paper by Rev. Dr. MacNish was read on "The present aspect of the Ossianic Controversy."

The following resolution was passed on motion of Mr. W. Hamilton Merritt, seconded by Mr. T. R. Clougher:—

"That one of the greatest benefits to commercial progress has been attained by the advances made in the manufacture of steel, especially by the Bessemer process, and that in Britain, the United States, and other countries where smelting works are in operation, they have had direct influence on the prosperity of the country; Be it resolved,—that the attention of the Provincial Government be directed to the advantages to accrue to the province by the construction of smelting works for our iron ores, and that a committee be appointed to wait upon the Government and request it to consider such means as in their opinion will aid in developing our iron deposits by the erection of smelting works."

Prof. Coleman and Messrs. Merritt, Clougher and Bain were named a committee in accordance with the resolution.

TWENTY-FIRST MEETING.

Twenty-first Meeting, 8th April, 1893, the President in the chair.

Donations and Exchanges, 55.

Messrs. Allan Cassels, Thomas W. Gibson, H. Maughan, Robert Percy Vincent, and A. L. Hoyles were elected members.

Mr. D. W. Beadle, B.A., LL.B., read a paper entitled "Danger of Introducing a very serious Pest destructive of our Peach Orchards."

Mr. Andrew Elvins read a paper on the Satellites of Jupiter, supplementary to one previously read on the same subject. He called attention to the fact that the period of the revolution of each of the satellites was double that of the next interior one, in accordance with Kepler's law. Thus, the satellite farthest from the planet is about 352 hours, the next nearer the planet is 176 hours, the next 88, and the next is 44, while the newly-discovered satellite revolved in 11 hours, or one-fourth that of the next exterior satellite. This discrepancy rendered it probable

that a satellite existed between the two latter, which revolved round its primary in about 22 hours. Mr. Elvins recommended astronomers to carefully search this space, as it was likely their labours would be rewarded by the discovery of a sixth satellite, revolving in accordance with Kepler's law.

Mr. Elvins closed thus:—"Reasoning in this manner, I ventured to suggest that it would be well to watch Jupiter closely during the opposition of 1892. My paper was read in May, 1891, and published in February, 1892, in the "Transactions of the Astronomical and Physical Society" of Toronto, and I wrote our local observers to look for satellites, or rings, which would doubtless be very faint, but would possibly be seen. I wrote Prof. Barnard, among others, and this reply, which I lay on the table, shows he received it. Whether that letter stimulated him to search for satellites or not, he has not stated. One thing is certain, he has made a diligent search and a fifth satellite being discovered has rewarded his pains. The French Academy of Science has tendered Prof. Barnard a double prize, a token of merit which he richly deserves. But had he mentioned the fact that I had suggested the possibility of the existence of a new satellite, the lustre of his discovery would not have been dimmed, and he would have been doing justice to one who has been a lover of the stars through a life which is now rapidly drawing to a close."

TWENTY-SECOND MEETING.

Twenty-second Meeting, 15th April, 1893, the President in the chair.

Donations and Exchanges, 85.

Messrs. C. P. Smith, Clarence E. Spink and G. K. Powell were elected members.

Prof. A. B. Macallum read a paper on "Archic Life."

TWENTY-THIRD MEETING.

Twenty-third Meeting, 22nd April, 1893, the President in the chair.

Donations and Exchanges, 57.

A circular from the Royal Society of Canada, transmitting copies of a schedule for the recording of observations in Natural History and Meteorology was referred to the Biological Section.

Mr. J. J. Foy and Rev. J. J. Hare, Ph.D., were elected members.

Mr. Alan Macdougall read a paper on "Road Improvement."

TWENTY-FOURTH MEETING.

Twenty-fourth Meeting, 29th April, 1893, the President in the chair.

Donations and Exchanges, 64.

Nominations for officers for the ensuing year were made.

The following gentlemen were elected members:—Messrs. E. B. Osler, Paul Campbell, George Williams, Charles P. Sparling, S. N. Samuelson and Oliver Spanner.

On motion by Mr. G. G. Pursey, seconded by Mr. C. Armstrong, it was resolved that the Public school teachers be requested to impress on their pupils, when they are gathering wild flowers, to be careful to pluck the flowers only and leave the roots undisturbed, and that the press be requested to give this resolution wide circulation.

Mr. Arthur Harvey read a paper entitled "The Outlook from Mount McKay," Mount McKay being one of the great hills which meet the view as the traveller enters Thunder Bay, on Lake Superior. The features of the territory overlooked by the mountain, the geography, topography, geology, were described and discussed by Mr. Harvey, and some practical suggestions were thrown out as to the development of the rich resources of the country.

FORTY-FOURTH ANNUAL MEETING.

The Forty-Fourth Annual Meeting was held on 6th May, 1893, the President in the chair.

Donations and Exchanges, 60.

The following were elected members:—Mr. Frederick Wyld, Mr. Thomas McCraken, Mr. John Chambers, Mrs. Alexander Cameron, Miss Bertha M. Shoults, and Miss Lilian C. Harrington.

President Harvey addressed the Secretary, Mr. Alan Macdougall, as follows:—"Some members of the Canadian Institute who admire the urbanity and tact with which you discharge the duties of the secretaryhip desire to present you with a token of their appreciation of your services and of their high personal regard. It is my pleasing duty to carry out their wish by handing you, in the name of the Institute, a silver inkstand with a short inscription." Mr. Macdougall replied.

The Forty-fourth Annual Report was read and adopted.

Professor Mavor was empowered to act as delegate from the Canadian Institute to the next meeting of the British Association for the Advancement of Science.

The officers of the Institute for the ensuing year were elected as follows:—President, Prof. R. Ramsay Wright, M.A., B.Sc.; First Vice-President, Mr. J. C. Hamilton, LL.B.; Second Vice-President, Mr. B. E. Walker; Secretary, Mr. Alan Macdougall, C.E.; Treasurer, Mr. James Bain, Jr.; Librarian, Mr. D. R. Keys, M.A.; Curator, Mr. David Boyle, Ph.B.; Editor, Mr. George Kennedy, M.A., LL.D.; Members of Council—Mr. J. Maughan, chairman of the Biological Section; Prof. Coleman, Ph.D., chairman of the Geological and Mining Section; W. Canniff, M.D, chairman of the Historical Section; and Mr. O. A. Howland, Mr. Arthur Harvey, Mr. Levi J. Clark.

A vote of thanks was tendered to the retiring President, Mr. Arthur Harvey, for his indefatigable labours in the service of the Institute during his term of office; also to the several officers for the faithful and efficient discharge of their duties during the past year. It was then resolved that the thanks of the Institute be tendered to the city press for their excellent reports of the proceedings of the Institute and its sections, and that a copy of this resolution be sent to each of the papers.

FORTY-FOURTH ANNUAL REPORT.

The Council of the Canadian Institute has the honour to lay before its members its Forty-fourth Annual Report.

The session which has closed compares favourably with past years in the number of papers read, the attendance at the meetings and the interest taken by members in the work of the Institute.

Twenty-four ordinary meetings were held, at which thirty-four papers were read. The work of the several sections was well maintained; the natural history or biological section, with its sub-sections, held twenty-seven meetings; the historical section six, and the geological and mining, six meetings.

The membership has increased by the election of twenty-five members, sixteen associate members and three juniors.

One honourary member and four corresponding members have been elected, the periods of election of the latter ranging from three to five years.

The Institute announces with much regret the death of several valued members.

Sir Daniel Wilson, LL.D., F.R.S.E., etc., President of Toronto University, an honorary member, during his long and valuable life, rendered marked assistance to the Institute, and occupied the Presidential chair in 1859-60, 1860-61, and 1878-80.

Nelson G. Bigelow, Q.C., LL.D., M.P.P., a life member, did not take a great interest in the work of the Institute in later years; his death was sudden at the end.

His Honour Sir Alexander Campbell, K.C.M.G., Lieutenant-Governor of the Province, was prevented by his official position and duties from taking a very active part in our work.

D. A. O'Sullivan, LL.D., was a frequent contributor to our meetings; his health of late years prevented his attending very regularly.

The re-arrangement of the rooms in the building, which has recently been effected, has proved very successful. The library, which was formerly hardly ever used, is now the general reading room; the spacious apartment affords ample accommodation for the comfort of the members. The acquisition of the reading room on the ground floor has enabled the natural history section to bring its collections together in a very convenient form for reference and study.

The conditions for the competition for papers on Electoral Representation and the Rectification of Parliament have been widely distributed. The competition closes on the 1st of July.

The centennial celebration of the formation of the Province of Upper Canada, and the institution of parliamentary government, was celebrated with great enthusiasm at Niagara on the 16th of July. This was followed by fitting ceremonies in Toronto on the 17th September, the centennial anniversary of the meeting of the first parliament, and the hundredth parliament was opened on the 5th of April with the state and ceremony which befitted the important occasion. The Institute was well represented on both occasions.

The report of the Provincial Commission on the Algonquin Park for the preservation of wild animals and the forest has been issued, and a bill to establish the park has been introduced into the Legislature by the Hon. Commissioner of Crown Lands. It is gratifying to find in this report the completed design which emanated from the Institute, and in which the Institute has never failed to take a deep interest.

The Council has pleasure in announcing that through the efforts of one of our city members, Lt.-Col. F. C. Denison, C.M.G., M.P., and the Hon. Senator Lougheed, the grounds and ruins of old Fort George at Niagara are to be preserved and cared for by the Government.

Action was taken by the Council in accordance with resolutions passed at the meetings, to secure some commemoration of the crossing of the Atlantic by the first steamer, in 1833. Dr. Sandford Fleming has proved conclusively that the Canadian steamer Royal William was the first to steam all the way across. The Government will probably erect a tablet to commemorate the event. A model of the vessel is being exhibited at the World's Columbian Exposition, and public documents relating to the crossing distributed to the public. The log of the Savannah, which has recently been published, proves that she steamed only in calm weather, and out of 29 days, 11 hours at sea, she steamed altogether only 3 days, 8 hours.

A joint committee of the Institute and Astronomical and Physica Society has prepared a circular to be sent to all the observatories and astronomers asking their opinions regarding a change in time reckoning, whereby the astronomical and civil day shall begin at mean midnight, and suggesting that the change shall be inaugurated in 1901.

The Institute was requested by the several provincial universities and McGill, Montreal, to send an invitation to the British Association for the Advancement of Science, to hold its meeting in 1895 in Toronto. The proposal was favourably received by the Provincial Government; the Dominion Government did not entertain the proposal on the basis set forth in our petition; negotiations are still pending, which it is hoped may terminate favourably to the prayer of the Institute, and result in the desired grant being made.

The appeal of the Institute to leading citizens for aid, and an increased membership has been widely disseminated; it is being followed up by a personal presentation of the claims of the Institute.

The Institute again acknowledges its indebtedness to the generosity of the Government in enabling it to continue its archæological work.

The report of the Curator will be found as full as ever of interesting matter. The report is being printed as an appendix to the annual report of the Hon. Minister of Education.

The thanks of the Institute are due and are tendered to Messrs. Cockburn, Denison, and Coatsworth, M. P.'s for the City of Toronto, for many services rendered during the last session; and to the CITY PRESS for full reports of our meetings.

The Treasurer's accounts have been audited and found correct. They will be found in Appendix I.

The report of the Librarian is given in full in Appendix III. It will be seen that the additions to the library continue to be numerous and valuable.

The reports of the Sections are given in the Appendices IV., V. and VI.

The Council acknowledges with pleasure the services rendered to the Institute by Mr. R. W. Young, M.A., Assistant Secretary.

All of which is respectfully submitted.

ARTHUR HARVEY,
President.

ALAN MACDOUGALL,
Secretary.

TORONTO, 29th April, 1893.

N.B.—The Appendices have been printed in full as a supplement to the Annual Report of the Hon. the Minister of Education.

SOCIAL ORGANIZATION OF THE BLACKFOOT INDIANS.

BY REV. JOHN MACLEAN, M.A., PH.D.

(*Read 19th November, 1892.*)

The Blackfoot Confederacy is named by the three tribes comprising it, Sâketûpïks, *the People of the Plains*, and Netsepoye, *the People that Speak the Same Language.* It is the custom amongst the mounted police and settlers in Alberta, where the three tribes are located, to speak of the Confederacy as simply the Blackfeet, and to name each gens after the chief of the gens. The natives follow their own customs, calling each gens by its own distinctive name, recognizing the fact that the chiefs may be removed by death and other causes, which would change the names; but by following their own native method, the names of the gentes are always retained. The Blood Indians are called *Kaina*, a name not definitely understood, but from all I could gather from the old men in the camps, it is derived from *Aikaie, an old robe*, and the application of this name to the tribe means that the people at one period in their history wore old robes, which were well-nigh useless, and it was at that time and because of that circumstance that they were thus named. This tribe is also named *Aapaitûpï*, Blood people, and Sûmûkegtûqkûnema, and Sûmûkena, which mean that these people had large knives with which they fought.

The Piegan tribe is named in the Blackfoot tongue Pikûnï, singular Pikûnïkwan, which is derived from Apikûni, meaning a half-dressed hide of the buffalo. The Indians say that there was a period in the history of the Confederacy when the Piegans were compelled through poverty to dress themselves in buffalo robes, which were badly tanned and almost worthless as an article of clothing.

The Blackfoot tribe is called Siksikauo, meaning Blackfeet. The singular number has always the personal termination *kwân*, thus Siksïkaikwân = a Blackfoot Indian. It is a compound word made from the combination of Siksïnûm, Black, and Oqkûts, his foot. We have the adjectival particle Siksï, the noun particles *kai* and *kaw*, and the personal termination *kwan*, which completes the word. There are two meanings given to this name, that is, as to its origin. The Indians have told me

repeatedly that the name referred to a period when the prairie was burned, leaving the ground black and dry. As the Indians travelled over the prairie their moccasins became black and they were named by the tribes adjacent Blackfeet. Jerry Potts, Government guide and interpreter, who is a reliable authority on questions of this nature, says that there is another account of the origin of the name, and he is strongly inclined to give it the preference. This tribe lived for some time in the northern part of the country, where the mud was soft and of a dark colour, and at that time, and from that cause, their moccasins became dark, and consequently they received the name of Blackfeet, which now they bear. This name has also been applied to the Confederacy by some as a distinctive name.

Many years ago the Blackfeet, Crees, Sarcees and Gros Ventres were one people, and lived peaceably together in the Red River country. Together these tribes travelled westward and settled near a large lake surrounded by woods in the country of the Saskatchewan. The present Provisional District of Alberta was at that time peopled by the Flatheads, Shoshonees, Crows, and other Indian tribes. The first white men whom the Indians met were the traders, who came to barter goods for furs and hides. From these traders the members of the Blackfoot Confederacy received guns, and they drove the Flatheads and Shoshonees across the mountains and the Crow Indians into the region of the Yellowstone. The Blackfeet do not now know the exact location of the lake where they settled many years ago in the north. During the period when the Crees and Blackfeet were one people they were travelling southward when a quarrel arose about a dog. Dogs were very scarce at that time, and hence the quarrel became an important one, involving the tribes. So serious did the affray become, and the hostility manifested so very great, that the Crees and Blackfeet separated and have remained independent until the present day. A long period before the advent of any white settlers the Blackfeet travelled as far southward as Salt Lake, hunting wild horses and buffalo, and they went eastward for trading purposes to a trading post at Qu'Appelle, in the provisional district of Assiniboia.

The three tribes, Blackfeet, Blood and Piegan, which constitute the Blackfoot Confederacy, are three distinct tribes, having no common council, or bond of unity, except the ties of a common parentage, language, customs, traditions and interests. I have never learned that any common council consisting of delegates from each of the tribes has ever been held since they separated. Whenever any important matter was under consideration which affected the Confederacy, a young man,

commonly called "a runner," was sent to carry the news, or a chief would be delegated as messenger, but generally one of the servants of the head chief. If it were a grave matter, the head chief of the tribe would undertake the mission, and upon his arrival would be treated in an honourable manner, as became such an august personage. The head chief and the minor chiefs of the tribe would then assemble and the matter would be brought before them by their illustrious visitor and discussed.

The state life in each of the tribes is the same. There is not a definite number of gentes in each tribe. There is not a common taboo for the gentes. Some of the gentes have a taboo, but not all. There is not one common to all, each gens which has a taboo has a distinctive one. There is one, however, which partakes of the nature of a common taboo, which relates to the Naâye gens. This gens will partake of fish, but none other of the gentes will partake of them. Sometimes a single individual will eat a piece of flesh of some bird or animal, and upon learning what it is will spit it out, exclaiming, "That is against my medicine."

There is one common ancestor for all the Indian tribes. He is not an ancestor in the proper sense, but a secondary creator. He is called *Napioa, the Old Man.* He is not the creator of the gens, or tribe, but of the whole Indian race.

Individuals belonging to one gens can marry into any other gens. The wife goes with her husband to his gens and lives there with him. If he dies, the widow can remain in her husband's gens or return to her own.

The Blackfoot Confederacy have not any adoption ceremony. I have seen women belonging to the Cree and Kooteenay tribes, and men who in their youth were Ojibways and Crees, and these were treated as members of the Blackfoot Confederacy, no distinction being made between them. None of these had ever gone through any adoption ceremony. In the matter of caring for orphans, they are looked after by the nearest relatives, and when these fail they are provided for by the tribe. They are never allowed to be in want, for the people say as they are of the same flesh and blood they must be cared for by the people.

There are several state classes, the most important being the chiefs. They are called *Ninaks, fathers, chiefs.* Of these there are three kinds, namely, two principal chiefs, the peace or civil chief, and the war chief, and the minor chiefs. The two principal chiefs have each one gens, and are also the supreme heads of the tribe. Each minor chief has a

gens, whose interests he attends to at the meetings of the council. Each member of the gens is specially protected by the minor chief. When Crowfoot, the principal chief of the Blackfoot tribe, was alive, the people belonging to the three tribes spoke respectfully of him, and had there been a supreme head for the Confederacy there is no doubt but that he would have been elected to that position, but whenever he visited the Blood Indians he did not preside at the council, but was treated as an august member of the Confederacy. Questions of a federal nature were submitted to him, as to the supreme heads of the other tribes. The Indians are a people jealous of their rights, and no one, no matter how noble his character and great his position, would accept of honours or usurp authority.

The war chief is the head warrior of his tribe. In the ancient days the mode of election was conducted in the following manner: When a warrior had shown himself to be especially brave, giving evidence of great courage, good judgment and honesty, and had won the esteem and affection of his tribe, the camp-criers, who were invariably old men, went among the lodges visiting the people and extolling the virtues of their candidate. By this means all the people soon learned the name of the candidate and his claims for the position. This action of the criers was kept up until the sun dance ceremonies were in full operation, and then the warriors mentioned the name of the man desired for the position. They expressed their wish for the election of their candidate. The person designated for the position was then placed in the centre of the medicine lodge, and the people declared him elected as war chief of the tribe by assenting with their voices. A rival candidate was easily thrust aside through the influence of the camp-criers. The criers were skilful in all matters affecting an election, so that it was a settled question who was to be the war chief before the sun dance began.

The duties of the war chief were to make arrangements for war, and to lead the warriors to battle. Virtually, he was supreme in the camp during a period of war. War could not be resolved upon without the concurrence of the council. At this council the peace chief presided. Small parties might go out to make raids upon their enemies, for the purpose of stealing horses, but these were of such minor importance that nothing was thought of them. When, however, the war was of a tribal character the council must decide, and when the decision was favourable to war, the war chief had almost, if not altogether, the sole control of the camp. At a council meeting presided over, some years ago, by Red Crow, the peace chief of the Blood Indians, to consider the question of going to war against the Sioux Indians, who were supposed to be within the territory of the Blackfeet, and therefore guilty of trespassing, it was decided to go

to war. *Natosonesta, Medicine Calf*, one of the most influential chiefs of the tribe, was not present at the council, and it was at last agreed to adjourn, to meet and hear Medicine Calf's opinion. The council met, and the chief was present, when the decision of the council was stated to him. The chief listened intently, and then asked,

"Where are the Sioux?"

"In our territory," was the reply.

"What harm have they done?" he enquired.

"They have not done any," was the answer.

Curtly then he spoke to the council: "I fight against my enemies!"

This ended the council meeting and the Blood Indians did not go to war.

The war chief was in the early days elected for five years, but now they retain their position for life, or until they are unfit to perform their duties. Since the institution of reservations, and the supervision of the Government, the chiefs are retained in their positions during good behaviour, or until death or incompetency removes them. The present war chief of the Blood Indians is *Manistokos, the Father of Many Children, alias* White Calf.

The peace chief is elected similarly to the war chief. His duties are to keep order in the camp, and to regulate all matters in the camp. He is the chief civil officer, and is supreme except in times of war. When the tribe is on the march he gives orders where the lodges are to be pitched collectively. Whenever anything happens as they are travelling the soldiers call a meeting in the chief's lodge, over which the chief presides. The question is discussed, and a decision arrived at, whereupon the soldiers receive their instructions from the chief and hasten speedily to obey his command. All petty grievances and quarrels are brought before him, and he gives his advice as to the manner of settlement. Grave questions affecting the tribe, and not of an individual character, are reserved for the council; but all minor disputes arising from theft, offences against the person, and questions of a similar nature are settled by the chief as judge, magistrate, adviser and father to his people. The peace chief must be therefore stern in giving his decrees, wise and sympathetic in counsel, dignified in his dealings and impartial in his judgments—a judge on the bench and a father at the lodge-fires of his people. At the camp-fire he is stern and dignified, at the lodge-fire sympathetic and humble. *Mikasto, Red Crow*, is the peace chief of the Blood Indians.

Besides the minor chiefs, one of whom presides over each gens, and the sum of them constitute the council, there is a class of men known as soldiers, warriors, braves or policemen. All the young men in the tribes aspire to the position. When a young man is anxious to become a warrior he presents himself to the war chief, who examines him, and if he finds him a suitable person he is admitted, if not, he is rejected. Sometimes a young man performs a brave deed which raises him so much in the esteem of the people that he is honoured. Without any application from him, when a brave act has been performed, he is admitted as a warrior. Promotion lies with the war chief, who raises his warriors to their respective grades, according to their ability and the display of their bravery. No man can be elevated who does not perform a warlike deed. The soldiers act as warriors in times of war, and during the periods of peace they are the policemen of the camps. They are therefore under the rule of the war chief in troublesome days, but in the peaceful days they are under the guidance of the peace chief. They keep order in the camp under his instructions. They are related to the chiefs as messengers. The writer remembers a detachment of black soldiers coming to Medicine Calf's lodge late one evening and taking away the wife of *Dog-Running-Back*. She had been married according to the native custom to an old man, but subsequently a young man named *Dog-Running-Back*, son of *Medicine-Calf*, had won her affections, and she escaped with him. It was an elopement, but these were of such frequent occurrence that the Indians spoke of them as "*stealing a wife*." The old man learned of the return to the camp of the guilty pair and he called in the aid of *Mikasto*, the peace chief, who sent the black warriors to arrest the woman. It was at midnight when they came to the lodge. They allowed her to ride upon her own horse behind them. As they rode through the bush she slipped off her horse, and under the cover of the darkness escaped. The matter was ultimately settled to the satisfaction of all parties concerned.

Jerry Potts told the writer that when he was war chief amongst the Piegans, *Running Wolf*, a Piegan chief, was guilty of a misdemeanor and was summarily treated, according to the laws of the tribe. The peace chief had given orders one evening, as they were on the march, that no one was to advance on the following day, nor at any time, without instructions. The war chief had under him fifty men, and as he was keeping guard he saw an object ahead of the camp, at a long distance. Jerry and his fifty men went out to ascertain what the object was, when they were surprised to see *Running Wolf* standing beside his horse, and upon the ground a dead buffalo. When asked the reason for disobeying orders he pleaded in extenuation that he only went out to get

this buffalo, as he had seen it; besides, this law did not apply to him, as he was a chief. The warriors looked at their leader, and at once he gave orders that the law must be obeyed by everyone, and anyone breaking the law must be punished. The warriors took *Running-Wolf*, stripped him naked, took away his horse, and made him walk to camp, a distance of seven miles. After some consultation in the camp his horse was given back to him, but they tore his blanket in shreds, and kept all the rest of his property.

There are several grades of warriors among the tribes. The writer found the following grades among the Blood Indians :—

Mokaikĭnûkĭ, the Brave Warriors: Heavy Shield is head of this band of soldiers.

Mastoqpatûpĭ, the Crow Warriors.

Imĭtaiĭnakĭ, the Dog Warriors.

Etsĭnakĭ, the Horn Warriors.

Kaispa, the Sioux Warriors.

Siksĭnaksĭ, the Black Warriors.

Potaina, better known as "Joe Healey," told me that the men must be thirty-four or thirty-five years of age before they are admitted into the ranks of the black soldiers. The highest position obtainable by a warrior is after having passed through all the military grades he receives the full rank of warrior.

The following gentes are found among the Blood Indians :—

1. *Siksĭnokaia, the Black Elk People.* This is the name of the gentes whose chiefs are Eagle Head and Blackfoot Old Woman. The legend says that a child was born very dark, when he became a man he wore an elk skin. He became a chief and his gens was named the Black Elk people.

2. *Inepoia.* This is the name of two gentes, Bull Back Fat's and White Calf's. There are two or three families in One Spot's gens who belong to the *Inepoia* gens. The legend says that a long time ago their ancestors walked a great distance and because of the journey and the heat they perspired freely, and then they were called *Inepoia, the Sweating People.*

3. *Otekûksĭn, the Short People.* This is another name for Bull Back Fat's gens.

4. *Apikaks, the People with the Sore Feet.* This is the name of the gens, of which Strangling Wolf is the chief.

5. *Mamyauye. Red Crow, Mikasto*, who is peace chief of the Blood Indians, is chief of the gens named above. This chief is also called Onĭstaĭâkapĭ. The gens has two names, and the legends state that there was a period when the tribe was absent hunting buffalo, and the members of this gens remained at the mountains, being unable on account of sickness to accompany the tribe. They had no buffalo meat, and they fished in the mountain streams, catching large quantities of fish, which they ate. They were therefore called *Mamyauye, the Fish Eaters.*

At another period in their history the brother of Red Crow was peace chief and also chief of this gens. During this time a friend gave unto him a revolver with six chambers, a rare thing for an Indian to possess at that time, and from this circumstance the gens was named *Naâye, Six Mouths*, from the six chambers of the revolver.

6. *Piksĭstaia, the Goose People.* This is the name of the gens of which Sakoĭstamĭk is the chief.

7. *Netaitskaia, the Bad People, Enemies.* Two gentes bear this name, one governed by *Heavy Shield* and the other by *Eagle Rib, Petoqpekĭs.*

8. *Imĭksenĭa, the Vexed People*, from *Maksenĭo—he is cross, vexed, angry.* Low Horn is the chief, and the legend says that many winters ago the chief of this gens died, and the people being unable to go out hunting the buffalo, because of the mourning time and there being no one to lead them, they were vexed.

9. *Ipûkĭmĭnoawa, the People with the Skinned Legs.* This is the name of the gens of which *Manĭstokos, Father of Many Children*, better known amongst the white people as White Calf, the war chief of the Bloods, is the chief. *Inepoia* is another name for this gens.

There are other legends connected with the gentes, but some of them are vulgar in their origin. Some of them seem to partake of the nature of nicknames. So far as I am able to judge, they must be accounted for in the same manner as the giving of names unto individuals. Generally each person has two names, a good one bestowed upon him for some brave action or worthy characteristic, and a bad one given because of contempt, for having been guilty of a foul deed, or it may arise from a mean disposition. Another class of names is given in a mood of playfulness to mark some humorous trait in the individual. The reason, then, why the Indians will never tell their names when asked arises from the fact that in pronouncing their names they are telling their characters. Modesty hinders the possessor from mentioning the honourable name and

shame from telling the comtemptuous one. The names of the gentes appear to be given in accordance with this custom of bestowing personal names.

Some of the aged men informed the writer that in the early history of the Confederacy some of the Indians were held in slavery, but they have held no slaves during the lifetime of any of the people now living. There are some old men, however, who act in the capacity of servants to some of the chiefs. I have never known any of these, although I have seen young men acting as messengers. Some of them seemed to hold an official position, for they were not related to the peace chief by marriage, although they belonged to the same gens. They undertook long journeys when ordered to do so, interpreted when they had the ability, and received no compensation for their work.

Since the making of the treaty the mode of forming a gens and of electing chiefs has been modified. An influential Indian may secure a large number of adherents through his boldness in proposing some popular measure, first by suggesting it, and by secret and incessant agitation keeping it before the minds of the people. His name will be brought forward at some interview with prominent Government officials after the way has been cleared by securing strong support from the people, a promise of investigation will be given, and the Indian council having nominated him, the Government will finally sanction his election, if that is in the interests of the tribe.

When the tribe is on the march there is a regular order of camping. This is a very simple arrangement, and there is not the elaborate and definite method of division which exists among the Dakotahs. When the people reach the place appointed for camping, the peace chief has his lodge pitched upon the westward side, he is surrounded by the leading members of his gens, and then eastward the chiefs have their lodges pitched at a sufficient distance from each other to allow the members of their respective gentes to surround them. The sacred tents are guarded by the soldiers. This latter arrangement has not taken place for several years, as I have never seen any of these sacred lodges, but I have been informed by the aged chiefs that such were in existence in the early years.

Several sacred pipes belonged to the Blood tribe, some of which are still in possession of the chiefs. The tribal pipe had a large stone head with figures of animals cut before and behind, the stem was about three feet long, made of wood, carved and painted, from which fringes of ermine skins were appended. A woman was detailed to look after it. In travelling, this woman carried it upon a horse, upon which nothing else

was allowed to be borne. After reaching the camp, it was taken into the lodge, being carried around on the right hand side of the lodge, never deposited in its place from the left hand side. Besides this pipe, of which there was one for each camp, there were sacred medicine pipes possessing great healing powers, of which we shall speak when we treat of the medical priesthood.

The Blood Indian Reservation is the largest Indian reserve in the Dominion. It is located between the Belly and St. Mary's rivers near Macleod, Provisional District of Alberta, the southern boundary of the reserve being about fourteen miles from the international boundary line. It is approximately sixty miles long by eighteen miles wide, and contains four hundred and seventeen thousand acres, or five hundred and forty-seven square miles. It was surveyed in August, 1883, in accordance with the amended treaty of July 2nd, 1883, by J. C. Nelson, Dominion Land Surveyor. The Indians have a timber limit in the Rocky Mountains, concerning which those interested will find full information in the "*Descriptions and Plans of Certain Indian Reserves in the Province of Manitoba and the North-West Territories, 1889.*"

In September, 1888, the Indian population on the reserve was two thousand one hundred and thirty-five. There was at that time one head chief and eighteen minor chiefs. There were twenty-one bands or gentes. So we have nineteen chiefs and twenty-one bands, but there were two bands without a chief. One of these contained nearly forty persons and the other nearly seventy, and a large majority of them were females. The number of children between six and sixteen years of age was about six hundred. The number of deaths during the year was as follows: forty-one boys, twenty-three girls, fifty-one adults. The adults' ages were chiefly from forty to forty-five years, but there were some of an extremely old age. The number of births was fifty-one boys and thirty-four girls. The amount of treaty money paid was ten thousand eight hundred and seventy-five dollars. The Indians are fed by the Government, and the daily ration averaged *per capita* 1.09 pounds of beef and .37 of a pound of flour. The number of acres broken on the reserve was two hundred and forty, and the number under fencing three hundred and thirty-five acres. The number of houses on the reserve was two hundred and sixteen. Several of the old houses had been rebuilt and improved by the Indians during the year, and fifty new ones had been erected. The Indians owned from fifteen hundred to two thousand horses and an innumerable company of dogs. During that year there were grown by the natives nine hundred and eighty-six bushels of potatoes from thirty-three acres. Owing to the dry rot the crop was not a good one. They

had ninety acres of oats, producing one thousand three hundred and fifty-six bushels; three acres of wheat with fifty-six bushels, and over twenty-five acres of garden produce, which did well. The number of employees on the reserve was the agent, farm instructor, clerk, interpreter, issuer and assistant issuer, cook, and three white men as labourers to teach the Indians farming. A medical man visited them regularly to attend to the sick. During the busy season of the year, say from March till November, four Indians were employed by the Government and received pay, all the rest of the Indians doing their own work.

In October, 1891, the writer paid a special visit to the reserve, and he found the Indians building better houses, growing larger crops, getting out hay contracts for the mounted police, and understanding more clearly their relations to the white settlers. At that time the average daily ration *per capita* was one and a quarter pounds of beef without shrinkage and .42 of a pound of flour. This would not be sufficient for supporting an adult, but when we note the fact that a child one day old receives the same, it can be easily seen that where there is a large family of children there will be sufficient. It is not the intention of the Government to feed them without doing something to support themselves, as that would beget and maintain a system of pauperization, but to keep them from being in want and at the same time encourage them to toil. The Indians receive their rations at the Lower Agency twice per week, and the same number of times at the Upper Agency. The reason for issuing at the two agencies is the distance of the bands from each other, the Indian camps being located for more than thirty miles along the Belly River.

It costs the Government about fifty dollars per head for supporting the Blood Indians. The Blood Indians consume over five thousand dollars' worth of beef per month. Five or six years ago they consumed over six thousand dollars' worth per month. The beef is furnished by contractors, who are paid eight and a half cents per pound. They must give the whole animal with the offal, but they are only paid by the weight of the four quarters, the head and offal being delivered, for which they receive not any compensation. All the hides which are not needed by the Indian Department for the use of the Indians are taken by the contractors at two dollars each. There are between seventy and eighty hides per month, of which the Indians use about thirty-five, the contractors paying two dollars each for the rest, the price being deducted from the amount paid for the beef.

From October, 1889, to October, 1890, there were born twenty-four boys and thirty-five girls, and there died twenty-two boys, thirty-one girls and fifty-five adults. The estimated population of the Blackfoot

Confederacy is about as follows:—Bloods, 1,700; Piegans, 600; Sarcees, 300; and Blackfeet, 1,100. The causes of the decrease are the same as are found amongst all native races, but this question will be fully discussed in a subsequent paper. Each Indian is paid annually the sum of five dollars for himself and the same amount for each member of his family. Each minor chief receives fifteen dollars and the head chief twenty-five dollars per annum, with the five dollars *per capita* for their families.

The following list of Indian names obtained by the writer at the Piegan reserve will reveal the method and meaning of Indian names. The names of some of the male members of the camp were Eagle Tail Feathers, No Runner, Chief White Cow, Dog Child, Crow Flag, Weasel Tail, Gives to the Sun, Elk Blood Head, Dog's Head, Sits in the Middle, Running Eagle, Man who Talks, Man who Lost his Blanket, Iron Breast, Black Weasel The Spider, Big Plume, Good Killer, Surrounded at Night. The names of some of the women were as follows:—Small Medicine Lodge, Weasel Woman, The Woman to Look at.

Strangers were always honourably treated, the best seat beside the chief being given, and the choicest pieces of the buffalo supplied. They were hospitable to the stranger when in the camp, and he was under the special protection of the chief. After he had gone, however, he was in danger at the hands of the young men, the renegades of the tribe, who felt free to deprive him of his property, when once he was beyond the jurisdiction of the chief.

A NEW READING OF THE BUDDHIST INSCRIPTIONS OF INDIA.

By John Campbell, LL.D.,

Corresponding Member Anjumani Punjab of Lahore, etc., Professor in the Presbyterian College, Montreal.

(Read 3rd December 1892.)

Those who have made a study to any extent of the early history of India cannot fail to have been struck with its shadowy indefiniteness down to the time of the Mohammedan conquest, in the eleventh century. The two native chronicles, the Raja Tarangini of Cashmere, and the Mahavansa of Ceylon, are little less doubtful authorities than the ancient epics, and the Puranas or mythological treatises. Abul Fazl, the other Mohammedan historian, and the Chinese Buddhist pilgrims add little that is trustworthy. When, therefore, it was known, through the labours of General Cunningham and his officers of the Archæological Survey, that ancient inscriptions abound in the sites of ruined cities and towns, great expectations were raised in the breasts of enquirers after historic truth, and a solution was looked for of those difficulties which compelled the translator of Lenormant's Ancient History of the East to omit the chapters on the history of the Indians. "To the book on the 'History of the Indians,' however, serious exception has been taken, not from any want of ability in M. Lenormant's treatment of the subject, but from a distrust of the reality of the foundation on which all the history of Ancient India rests."[1] It was confidently hoped that the reading of the inscribed monuments would remove the cause of this distrust, but such has not been the case.

The most important, because the most ancient, of these inscribed monuments are known, from their structure and from the emblems which accompany them, to be of Buddhist origin. The written characters engraved upon them have been, therefore, called Buddhist, and they constitute what is sometimes termed the Lat Alphabet, because many of the inscriptions in them are found on *lats* or pillars. This alphabet is square, as is the modern Hebrew, but has no connection with it, nor with any other alphabet, Semitic or Aryan. Nevertheless, it appears to have been the foundation of the Sanscrit or Devanagari characters, and

of other legible but aberrant types of later growth found throughout India and extending beyond its borders.[2] The phonetic powers of the Lat Alphabet remained a mystery down to 1838, when Mr. James Prinsep, secretary of the Asiatic Society of Bengal, announced his discovery in the journal of his society. After some discussion, it was generally agreed that Mr. Prinsep had found the key to the Buddhist inscriptions by identifying their characters as forms of the well known Devanagari.[3] Hundreds of inscriptions have been partially translated, some of them of considerable length. They are not Sanscrit, they are not Pali, though more like that than anything else; their language is a sort of *lingua franca*, intelligible only to their translators, and not always even to them. They are full of dates and donations and mendicant monks, and do not afford a single satisfactory fragment of ancient history. For all the gain they are to the historian they might as well have kept their worthless secrets.[4]

The translations of Mr. Prinsep, General Cunningham, Professor Dowson, and many learned Babus, proceed on the assumption that the writers of the documents were Brahmans, or at least an Aryan people. Philologists have conclusively shown that the substratum of Indian speech is Turanian, a substratum that exists, almost in its integrity, among the aboriginal or non-Aryan tribes of the empire.[5] Archæologists also have referred the most ancient buildings and monuments of India to these Turanians, who excelled their conquerors in the magnificence of their architecture.[6] There is no evidence that Brahmans ever became Buddhists, whose religion was a revolt against their own. Gotama Buddha himself was a Kshattriya, not a Brahman, and although many people of Kshattriya descent may be found among the Hindoos of to-day, this fact no more makes an Aryan of the original Kshattriya than incorporation in the west makes an Italian of the Etruscan, or an Englishman of the Pict. All over Europe, in Armenia, in Kurdistan, and in Persia, the Aryan incorporated the Turanian, annexing part of his speech and assuming the greater portion of his history and mythology as his own property, but nowhere was this process of amalgamation so complete as in India. The Brahman pantheon overflows with Turanian deities, the Indian epics are the records of Turanian warfare and adventure, the very post-positions of the Sanscrit language exhibit Turanian influence upon something more stable than mere vocabulary. That there was a genuine Turanian empire in India is proved by architectural remains, which are many of them easy to identify with Buddhist cult. Did the wealthy monarchs and powerful emperors who built these great edifices leave no written trace of their existence? Unless Mr. James Prinsep was mistaken, they did not. I prefer to believe that Mr.

James Prinsep was mistaken, and that his mendicant monks, etc., are the result of an utterly foundationless system of interpretation.

There was a time when the Turanian was regarded as a savage, having no part in the civilization of the world, which was supposed to have been accomplished altogether by peoples of Semitic and Aryan origin. True, the Egyptians and Phœnicians have always been credited with much of the world's early progress, but the language of the former was sub-Semitic, and that of the latter purely Semitic, whatever their original nationality may have been. No ancient Turanian writing was known. Nevertheless, there were such unmistakable evidences of early culture, distinct from that of Semites and Aryans, that anthropologists adopted various hypotheses to account for it, the chief of which was that known as the Cushite. These hypotheses led to nothing. But, after the cuneiform character had been mastered, it was found that at least one of the languages written in it, namely the Akkadian of ancient Babylonia, was not Semitic but Turanian, its affinities being with the Ugrian languages of Europe, still existing on the shores of the Baltic, along the Urals, and in Hungary. The Akkadian was a very ancient civilization, from which the Assyrians and later Babylonians borrowed largely. Of late years, the Hittites have come into prominence by their widely scattered monuments, and through the records of their numbers and their prowess contained in the Egyptian and Assyrian records. They also were a Turanian people. There was still another ancient people, closely allied politically, but neither ethnically nor philologically, with the Akkadians and the Hittites. These were the Sumerians, of whom we yet know very little, but who will yet appear, by indubitable testimony, as the eastern ancestors of the Celts. With them, however, we have at present nothing to do. Since Dr. Edkins, of Pekin, first drew attention to the subject, attempts have been made to connect the Akkadians of old with the Chinese of to-day by more than one writer; but none, save myself, has sought to trace in other lands, with the exception of Dr. Sayce, in Asia Minor, the powerful and widely spread Hittite nation.[7]

It may pertinently be asked why I select the Hittites rather than any other people of Turanian origin, in seeking the rise of ancient Turanian culture. The answer is, because there is no evidence of such culture having been developed by any other branch of that division of the human family, unless it were by the Akkadians, and these I firmly believe to have been under Hittite rule. Comparatively few families of the human race have achieved a historical position, the greater number constituting the Ground race, which possesses no independent history.

Certain families, endowed with peculiar virtues, physical and mental, rose to the position of kings of men, and lorded it over sections of the Ground race. Such kings of men among the Turanians were the Khita or Hittites, and under their power fell Semitic descendants of Aram, Lud, and Elam, and many Hamitic, and, perhaps, even Japhetic families. Thus, the historical Turanian peoples of antiquity, whatever the origin of their physical substratum, bore the Hittite name until their dispersion by the arms of the Assyrian Sargon in the end of the eighth century B.C., and some of them down to a much later date, as witness the Khitan of northern China in the tenth, eleventh and twelfth centuries A.D., and the Khitts of the Siberian Yenisci at the present day. In a former paper, I have shown that the people who built up a large wooden civilization in Siberia from the fifth century onward, and who left written monuments behind them, were branches of the Khitan, as their monuments denote, and, at the same time, the Japanese in migration. They migrated to Siberia from northern India, and their language is that fundamentally of the aboriginal or Turanian peoples of Hindostan. They were Buddhists, some of them fleeing from the persecution of their Pagan relatives or of the rising Brahman.[8]

The Siberian characters are not identical with those of the Lat alphabet, being much more rudely formed; but it is a matter of very little difficulty to exhibit the essential unity of the two systems of writing. In tracing the characters west of India, and between that country and the ancient Hittite habitats in Media, Mesopotamia, and Syria, they appear on Parthian coins down to and beyond the Christian era, but, so far as the time of migration is concerned, the labours of the excavator have not yet discovered the historical connection. A study of the original significance of the hieroglyphic Hittite characters enables the investigator to recognize, in the Parthian and Lat Indian, conventional or cursive forms of the same, and to read them without difficulty. When thus read, the inscriptions yield, like the Siberian, archaic Japanese. In this connection I may say that Dr. Jonathan Goble, who was a member of Commodore Perry's expedition to Japan, and who has studied Japanese for more than forty years, thus corroborates my Siberian readings: "As translated by you, I find these ancient legends almost pure classical Japanese, that I can make out without the least difficulty." As I do not claim the ability to write classical Japanese, it is evident that I must have found it already written. Such also is the language of the Buddhist inscriptions of northern India, whose writers, in several places, call themselves by the name Kita. Some translations of these I have presented in The Hittites, and a number of them, furnishing important data for India's lost history, will yet be found in the

Hittite Track in the East. I may add that a copy of an imperfect inscription in the Siberian character, found in Japan, has been lately sent to me.

The differences between Mr. Prinsep's method and results and those pursued and attained by me are: first, that while he has regarded the inscriptions as the work of an Aryan people, I have identified them with India's aboriginal population. He has, therefore, sought to find in their characters an Aryan alphabet, and has certainly succeeded in showing that the Sanscrit letters were derived from them. While not disputing his conclusion, I deny the inference that the writers of the Lat and those of the Devanagari attached the same phonetic values to the related characters. This inference in Asia Minor, in Etruria, in Celt-Iberic Spain, and elsewhere, has hitherto closed the gateway of knowledge and concealed the existence of ancient Turanian letters and history. Secondly, while the translations of Mr. Prinsep, and his scholarly coadjutors and successors, are made, often very inconsistently, out of a bastard Pali, otherwise unknown, those I present are made consistently throughout in classical Japanese, such as scholars can read without difficulty. Mr. Prinsep and his followers, thirdly, leave many parts of inscriptions untranslated, while I maintain, and prove in practice, that a whole document only partially translated is not translated at all. Fourthly, inscriptions, as read by Mr. Prinsep's alphabet, present unhistorical bathos. As read by mine, they are found to be royal documents of great historical importance. In fine, I stand towards Mr. Prinsep's system in the same attitude as I stood, and now still more firmly stand, towards those who read the Etruscan characters with their Greek equivalents. The so-called Lat alphabet is, like the Etruscan and Siberian systems of writing, a Turanian or Hittite syllabary.[9]

The fish like character denoting an m syllable, the rounded yoke or bow one giving a power of r, and that shaped like a square Hebrew *shin*, which has the phonetic value *go*, alone serve to link the Lat syllabary with the ancient Hittite, on the one hand, and, on the other, with the so-called runes of Siberia. Where and when did the cursive Turanian writing originate? It is natural to think that it followed the Hittite hieroglyphic; but, so far, we possess no Hittite hieroglyphic documents that approach by many centuries the most ancient inscriptions in the cursive syllabary. In the Sinaitic Peninsula, and dating back to the time of the patriarch Abraham, are Hittite documents of enormous value to the historian, and these are all in the cursive character.[10] Hittite hieroglyphics must thus have been much earlier, since there can hardly be any doubt that the conventional cursive was the

simplification for ordinary use of the original cumbrous hieroglyphic in Hittite as in Egyptian. The proof of the antiquity of the Sinaitic inscriptions will appear shortly in "The Hittites in Sinai," in which I have translated over a hundred of these venerable documents, records of the kings who reigned in Edom, of the princes of the Hittite confederacy, and of the shepherd kings of Egypt and their viceroys. It is probable that all alphabets and syllabaries may yet be traced back to one original, doubtless hieroglyphic in character, when it will be found that the variation to be considered most is not the form of the symbols but the varying phonetic values which diverse peoples attributed to the same form. As I have elsewhere stated, the names Aleph, an ox; Beth, a house; Gimel, a camel, and Daleth, a door; given by Semitic peoples to the first few letters of their alphabet, are proof positive of a hieroglyphic origin, and that a Turanian people would make such characters stand for the first syllable of ox, house, camel, and door in their own language. In the accompanying plates I present the equivalents of the Buddhist or Lat Indian syllabary, both as set forth in the Asoka proclamations and in ordinary royal inscriptions, and the texts I have chosen for illustration. My object is to aid scholars in interpreting these ancient monuments, and thus to place the early history of India on a firm foundation. The variations of characters in the Asoka proclamations are really a species of vowel notation, as yet imperfectly understood. Those in the ordinary syllabary are partly of the same nature, and partly due to changes in style arising from difference of time and place. As the most ancient inscription read is of 337 B.C., and others are later than the Christian era, it is natural to find varieties of style in writing. The characters represented in the plates are gathered from thirty-seven inscriptions, and are sufficient to enable the student to decipher any ordinary Buddhist Indian document presented to him.

The first text I present is that of the proclamation of Asoka, the Buddhist Constantine, found at Girnar. This I read, not as the interpreters of such inscriptions have so far done from left to right, but from right to left. The transliteration gives:—

I.

1. *shi · keki · shimane kiwame · ta ga*
2. *tashita · rikidowa ka ashika nega ki*
3. *girifu no aka hoi ochi · manete*
4. *janage ta fumi kareta nomija hitoshi*
5. *nai · kanegaki kaki · shimane rakajimu nomija*

6. *shimane · rametaki nomija tada · waraki-kuyashi*
7. *yajashi kimi oju ko asoka nega kiki kaki*
8. *mi · kami nise ochi ko asoka nega oja kaki · shimane*
9. *ka amakeja jahoi ochisa kage jarija sageshi ja*
10. *kimi ta ari o aba wa ketsu me-ta · goyoshi no · gune ochi ja*
11. *kija · ro medota amanji amake jai hoi ochisa*
12. *o · ja hoi ochishi maji · saki riyoki ri tama tashiremi*

II.

1. *go yasoki nega kija · kaki-shimane mori nomi arima ja*
2. *mi · riyoshi araja wareta riki ga araja · nakena tomi gijo ri · doji kimi mito*
3. *jame araja takara · ochi ja-rikima ga norashi go tokara-ochisha-ki*
4. *arata · mita adan go yasoka nega kija kaki · shimane arimaja sonaye*
5. *tosha arakiku sumeshaka · tosha fujune tomata tokiji tomata tokashime*
6. *tosha arakiki o tosha araki akerami jagasha rakuraku · tosha aritaka ji*
7. *tosha arakiki o tosha araki · akerami · jagasha-rakuraku-tosha wabi tosha wa amu*
8. *shiki sumijaji ga aruha · yajira kiki yado mamori kisha buda kido `jomaye · ji*[11]

The following is the translation of this inscription, as closely rendered as English construction will permit:—

I.

1. Do, I pray, what the amnesty defines.
2. Hear the desire of the accomplished warrior, the excellent Asoka.
3. Cease to imitate the evil customs of the unrighteous.
4. Take individually the confession which the writing has given.
5. Do not deliberate, I pray; receive pardon beforehand.
6. Accept universal pardon gratis, repenting wickedness.
7. Obeying the amiable lord, hear, I pray, the desire of the excellent Asoka.

8. Behold, leaving false gods, obey, I pray, the desire of the excellent Asoka.
9. For pardon leave pleasant evil rites, despise secret sports.
10. He who deserts the army of the violent will obtain protection from him who is lord.
11. Hear, quit the pleasant evil rites delighting in beguiling lust.
12. O do ye forsake evil rites, Tsurami, sovereign of the kingdom of the Sakis.

II.

1. Hear, I pray, the desire of the excellent Asoka: do ye accept the amnesty.
2. Behold, violence, the violence of strength, has divided the kingdoms. Within, law and justice cease: alike are lord and king.
3. Leave the assembly of assailing violence; leave the assembly of the measurers of strength. Hearken!
4. Hear, I pray, the desire of the new king named the excellent Asoka. Pardon is offered you.
5. Ended are the violent years; the evil years have ended now, have ended forever.
6. The violent years, O the violent years, blushing, I despise. Shall there not be years of pleasantness?
7. The violent years, O the violent years, blushing, I despise. Let years of pleasantness, a circle of peaceful years, remain.
8. As the master of the dwelling, hearing the housebreaker, guards the abode, so lock the door of Buddha.

Under the name Tsurami, Asoka appears in an inscription on a stone found in a mound at Mathura. Unfortunately this inscription and others of Tsurami are much defaced. It is No. 1 on Plate IV. The defacement is in the lower line, but the words, *Gotama shone wo*, can be made out, and, as elsewhere, the expression *Gotama shone wo ireru*, to give close attention to Gotama, or, as we would say, to give the heart to Gotama, appears as a Buddhist formula, it may be taken for granted that such is the meaning of the partially erased sentence. The upper line is quite distinct, and, from right to left, reads as follows:

No. 1. *Katame gosari mashi tsushigo tsugo butsu kisafuki Tsutemama Watatami Mareware Bushiyama go mito Tsurami futa ki 2 fu Buda go*[12]

The translation is: "I have a vow, Tsurami, surpassing all the warriors

of the earth, king of the Tsutemama, the Wata people, Marwar, and Fushiyama; 2 hundred 2 score after Buddha."

The next, No. 2, Plate IV., accompanies a naked standing figure. General Cunningham says: "The first part of this inscription is the only important part of it, the rest being a mere string of names of the donors." Having suggested emendations, he continues: "Adopting these alterations, the opening may be rendered as follows: 'Glory to the Arhat Maharira, the destroyer of the Devas!' (In the reign) of the King Vasu Deva, in the Samvat year 98, in Varsha (the rainy season) the fourth month, the eleventh day. On that very date, etc."[13] Now one ought to be able to do a great deal better than that. The upper line of the main inscription is complete, and the sense of that immediately below it, in which two characters only are wanting, can be accurately determined. The lower lines are very much broken, so that the left half only of the first of these affords material for decipherment. The subordinate square inscription on the right can be made out, but seems to lack a concluding word. The latter may be called the fourth part of the inscription, the other legible lines being 1, 2, 3, from top to bottom. The reading is, as usual, from right to left.

No. 2. Line 1. *Kumiwa mabu Buda hiromeku Tsumaki tama anoho atsufushi magetsu hime wo mire fui ochi tashi bun tsuku*

Line 2. *Sibir mafu ketaru toriwima Watatami Doidota Sibir ga wabi Kitsuuchi ga mito*

Line 3. *Gorami ga yome tsutaru betsu sai Amrita tsuta hime tatsuri*

Line 4. *Tsurami 1 meku maki 4 samura kami Kitsuuchi tsu tsudotatsu wo yobidata nedo ga kifuta.*[14]

The translation is: "The associated monks, proclaiming Buddha, affix the edict, allowing to be seen this great effigy (resembling monument) of the descendant of Tsumaki. Diodotus of the Wata people, king of Sibir and the peaceful Kitsuuchi, tarries to talk over (the affairs of) Sibir. Amrita, the principal wife of (his) successor, joins the widow of Gorami in setting up the monument. Tsurami summoned an assembly of 1,004 nobles of the Kitsuuchi (to inaugurate) the gift of the wife."

As unsatisfactory is General Cunningham's rendering of No. 3, which is on the pedestal of a life size naked figure. He reads: "(In the reign) of Maharaja Vasu Deva, in the Samvat year 83, in Grishma (the hot season) the 2nd month, the 16th day. On that very day the gift of an

image. 'The rest cannot be made out satisfactorily.'"[15] It is true that parts of the document are defaced, nevertheless I read:

No. 3. *Tsushiku ga mito Tsurami 2 maki 2 fu 3 Buda go Tsumaki tama fumi tsuku*

*Amrita ga koga sai Gorami mesume tsuta dzubotsu * ma * mu go bu ma tsuraka aritama*[16]

Translated, it says: "Tsurami, king of the world, 243 after Buddha, affixes the usual writing of the descendant of Tsumaki. His servant . . . joins Amrita, his consort, the daughter of Gorami, in renewing the likeness. . . ."

A brief inscription on the base of a pillar, from Mathura like the preceding, contains the name of the ancestral Tsumaki.

No. 4. *Tsumaki mito Tsutaka Saka ga mito tsuyoshi yaku maki 3 fu Buda hiromeku* [17]

The translation is: "King Tsumaki, the mighty king of the Tsutaka Saka, 160 Buddha proclaims."

But General Cunningham's version is: "In the Samvat year 47, in Grishma (the hot season), the 3rd month, the 5th day. On that date the gift of the mendicant Dharma Deva."[18]

The oldest inscription I have yet translated is:

No. 5. *1 maki 4 ma Buda go Kafutake tori Kita;*

which, being translated, is: "140 after Buddha, the Kita choose Kafutake."[19]

Professor Dowson reads it: "Presented pillar 126 in the Samvat year 47, in Varsha (the rainy season), the 4th month, the 11th day."[20]

Finally, the following document appears inscribed in a circle surrounding the base of a pillar taken from the Jail Mound at Mathura, whence also came the inscriptions of Tsumaki and Kafutake. It is the clearest and most perfect of all the inscriptions read. It commences at the left hand side, at the break or open space near the bottom, and proceeds upwards and so round the pillar.

No. 6. *Bikrama goku agameke Matori fu arukumeku yobutata yodatsute ashikaze katsu daman Tsutaka Saki Afumi tsutome tatsure tami ki tsuneha renha, tsuneha fumi 4 ki 4 fu Buda go*[21]

Translation: "Vicram, the valiant, ruling the exalted city Mathura, summoned serviceable foot-soldiers to exterminate the Tsutaka Saki.

The mind of the people to serve Afumi sets up the usual orderly customary writing 480 after Buddha."

This, Professor Dowson interprets: "In the Samvat year 47, in Grishma (the hot season), the 4th month, the 4th day. Gift to the Vihara of the great king, the king of kings, the son of heaven, *Huvishka* by the mendicant Jivaka Udeyana. May it be to the benefit, welfare, and happiness of all in the four quarters (of the world)." [22]

In commenting briefly upon the preceding inscriptions, which will be discussed at length in my Eastern Track of the Hittites, the first thing to consider is the matter of date. The era is that of the death of Buddha, for which many dates are given, varying from 543 to 477 B. C. Vikramaditya is said to have fixed the Samvat era in 56 B. C., and with this statement the last inscription, which puts an event in his reign 480 years after Buddha, or 63 years B. C., according to the long computation of that reformer's death, agrees. But No. 3 places Tsurami or Asoka in 243 after Buddha, and No. 2 makes Diodotus of Bactria his contemporary. Now, the eldest Diodotus began to reign about 255 B.C., and the younger in 237 B.C. If 543 be the date of Buddha's death, Tsurami's date and that of Diodotus is 300 B.C.; but, if 477 be the true figures, the interview between Tsurami and Diodotus was in 234 B.C., which better satisfies chronology. The Buddhist convention under Asoka is said to have been held about 250 B.C., so that the date 543 is completely ruled out of court. The oldest date found, that of Kafutake, is 337, that of Tsumaki is 317, and that of Vicramaditya, 3 A.D.

Kafutake is the Gopaditya of the Raja Tarangini, which presents its array of Turanian monarchs in a Sanscrit dress, and he is the Sopeithes of Strabo, or, as Curtius calls him, Sopithis.[23] Strabo calls him a monarch of the Cathaei, and says that he opened his city gates to Alexander of Macedon and entertained him royally. This was in 326 B.C., or eleven years later than the inscription. Kafutake must have been an old man before he died, for another inscription of his states that, in 180 after Buddha, he superseded the Nandas by the Sakas. He may thus be also identified with Chandra Gupta, who overthrew the Nandas. Tsumaki, therefore, whose date is 317, must have been his contemporary during part of his long reign, and may be identified with the Sisunaga who helped Chandra Gupta in his revolution, and with the Sangaeus, whom, according to Arrian, Alexander set over Peucolaitis.[24] Both Kafutake and Tsumaki belonged to the Sakas or Sacae, but the former was also elevated to the throne of the Kita, who are the Cathaei of ancient writers on India. The Indian name for Tsurami is Dharma, often conjoined with his religious title Asoka, which is just the Japanese

yasuki, the peaceful, in the form Dharmasoka. He seems to have been recognized by all the Hittite rulers of northern India, and even of countries to the west of it, as an emperor or king of kings. One of his inscriptions enumerates the Tsutemame or Sushmins, the Wata, Futa, or Bakhdi, that is the Bactrians, the people of Marwar, and the Fushiyama, or ancient Kambojas to the north-west of Cashmere, as his subjects. The Bactrians, however, were under the sway of Diodotus, as were the Sibir or people of Cabul, so that Diodotus must have been tributary to Asoka.

Several inscriptions of great interest illustrate the intervals between Tsurami and Kafutaki on the one hand, and between him and Vicramaditya on the other. These are set forth with ample comment in the Hittite Track in the East. Vicramaditya, who on his inscription calls himself simply Bicram, sets himself forth as a Tsutaruki or Gupta king, by making Afumi, the Abhimanya of the Raja Tarangini, his heir to the throne.[25] The overthrow of the Sakas by this monarch is one of the best attested facts in ancient Indian history. If, as seems most probable, the date of Buddha's attainment of *nirvana* was 477 B.C., this event must be placed at or near the year 3 A.D. If he re-established Brahmanism, or rather the heathen worship of his own race, which contributed to modern Brahmanism its chief elements, as is very probable, seeing that several of his predecessors apostatized, his change of faith did not affect his successor Afumi, who appears to have remained a Buddhist. The kings of the Sakas belonged to the Varma dynasty, and, on another inscription mentioning Vicram and Afumi, are also called Kitan. No inscription so far read by me makes any mention of a Brahman. When idolatry is referred to, it is called the worship of the old gods, in other words, the Sintoism of Japan. There is not the least evidence for an ancient Brahman kingdom in India, but it will be very hard to convince a Hindoo that none such existed. However, the missing materials for the ancient history of India are now in the world's possession, and a little labour on the part of epigraphers, who are also Japanese scholars, will soon bring a flood of light to bear upon one of the most interesting but, until now, most obscure chapters of the history of the past.

NOTES.

[1] Lenormant and Chevalier, Manual of the Ancient History of the East, Vol. II., preface.

[2] Max Müller, a Sanskrit Grammar for Beginners, p. 1.

[3] Journal, Asiatic Soc'y of Bengal, March, 1838, pp. 219 seq.

[4] Reports of the Archæological Survey of India.

[5] Hunter's History of India, p. 23.

[6] Ibid.

[7] Edkin's China's Place in Philology: Rev. C. J. Ball and others in the Proceedings Soc'y Bib. Archæol., and in the Babylonian and Oriental Record: Campbell, The Hittites, etc.

[8] Siberian Inscriptions, Trans. Canad. Inst., 1890-91, Vol. II., pp. 261 seq. See also The Hittites, Vol. II., p. 325.

[9] See my Etruria Capta, Proceedings Canad. Inst., 1885-86, pp. 144 seq.

[10] Over a hundred of these I have translated in The Hittites in Sinai, yet to appear.

[11] Analysis of the Asoka proclamation:

Part I., line 1. *Shi*, now *se*, imperative of the verb *shi*, *su-ru*, to do.
kaki, now *kashi*, a word used at the end of a sentence of exhortation, entreaty, or request, to give emphasis to it. May be Englished by, I pray you.
shimane, now *shamen*, pardon, subject of *kiwame*.
kiwame, part of verb *kimawe-ru*, to define, determine, decide.
ta, the relative, who, which, generally followed as here by its genitive particle *ga*.

line 2. *tashita*, now *tasshita*, preterite of *tasshi*, to be thoroughly versed, expert, or proficient in.
rikidowa, now *riki-idomi*, strong contender, warrior.
go, a term of respect or politeness used in addressing a superior, meaning honourable, excellent.
Yasoka or *Asoka*, the religious name of the monarch.
nega, now *negai*, desire, request, prayer.
ki, part of the verb *kiku*, to hear. The imperative *ja* probably followed *ki*, but, if so, it has been erased from the inscription.

line 3. *giri*, right, just.
fu, a negative particle.
no, genitive post-position.
aku, bad, wicked, qualifying *hoi*.
hoi, now *hō*, rule, law, precept.
ochi, to fall, leave, run away.
maneta, preterite of *mane*, *maue-ru*, to imitate, do like.

line 4. *janage*, now *sange*, confession, acknowledgment.
ta, the relative.
fumi, a writing, book, letter.
kareta, now *kureta*, pret. of *kure*, to give.
nomi ja, now *nome yo*, imperative of *nomu*, to drink, swallow.
hitoshi, now *hitoshii*, same, equal, alike, literally one man.

line 5. *nai*, not, is not, have not.
kanegaki, now *kangaye-ru*, to think on, reflect, consider.
kaki, or *kashi*, and *shimane*, *shamen*; see line 1.
rakajimu, now *arakajime*, beforehand.
nomi ja or *nome yo*; see line 4.

line 6. *rametaki*, mostly, now *aramattaki*, a combination of *ara* as in *aramashi*, generally, and *mattai*, *mattaki*, whole, complete, entire.

line 6. *tada*, adverb signifying, only, merely, but with verbs of giving and receiving, hence gratuitously.

waruki, adjective *warui*, *waruki*, bad, but here used as a noun, wickedness.

kuyashi for *kuyami*, to repent, whence *kuyashii*, producing repentance.

line 7. *yajashi*, now *yasashii*, amiable: same root as Asoka.

kami, superior, ruler, lord.

oji, *ojiru*, to fear, dread, or *ōji*, *ōjiru*, to obey, comply.

kiki, to hear; see line 2.

line 8. *mi*, imperative or interjectional form of *miru*, to see, behold.

nise, false, counterfeit, as in *nise-gane*, counterfeit money.

ochi, to leave; see line 2.

line 9. *ga*, genitive post-position governing *shamen* of preceding line: here to be Englished by *for*.

amaki, adjective *amai*, *amaki*, sweet, pleasant, also foolish.

jahoi now *jahō*, wicked religious rites.

kage, shadow, and, metaphorically, secret, unseen.

jarija, noun, from *jare*, to play, frolic, sport, *jarashi*, make to play.

sageshi ja, imperat. of *sageshime*, to look down on, despise.

line 10. *to ari*, now *tari*, from *ta*, who, and *ari*, is, who is.

yo and *yu* are ancient poetical forms of the preposition *yori* from.

aba, now *abai*, to shield from danger, protect, defend, but here a noun.

wa or *wo*, the untranslated sign of the accusative case, here governed by *katsu me*.

katsu, to gain, conquer. The following *me* is a future particle (Aston's Grammar, p. 168).

ta, the relative.

goyoshi, now *tsuyoshi*, strong, powerful.

no, genitive particle.

gune, now *gun*, army.

line 11. *ki ja*, imperat. of *kiku* to hear.

ro, now *iro*, love, lewdness, lust.

medota, now *madotta*, pret. of *madoi*, to err, be deluded, misled.

amanji, to relish, delight in.

line 12. *mashi*, an old form for "you" (Aston's Grammar, p. 63).

riyoki ri, better *riyo giri*, rightful kingdom.

tama, master, qualified by the adjective *giri*, and, with it, governing *giri* in the genitive of position.

Part II., line 1. *mori nomi*, compound verb, consisting of *morai*, receive, accept, and *nomi*, drink, swallow.

arima ja is not *arimasu*, the honorific form of *ari*, to be, to have, but *ari* with an abbreviated form of *mashi*, *imashi*, the old 2nd personal pronoun, and the imperative sign *ja*.

line 2. *riyoshi* or *riyochi*, estate, kingdom.

araja or *arasa*, violence, harshness.

wareta, now *waritta*, pret. of *wari*, to divide, part, rend asunder.

riki, strength; *ga*, genitive post-position.

nakena now *naka ni*, within, composed of *naka*, middle, among, and *ni* post-position, in, into.

tome, part of verb *tome*, *tomeru*, to stop; *tomari*, to cease.

line 2. *gijo*, law, statute, ordinance.
ri, right, just, proper.
doji, composed of; *do*, same, and *ji*, way; hence, "alike," synonym of *onaji*.
kimi, if properly transliterated, is same as *kami*, lord, master.
mito, king, same as *mikado*, door being *to* or *kado*.

line 3. *jame araja*, now *seme arasa*, from *seme*, *semeru*, to assault, attack, harass, and *arasa*.
takara, noun derived from *takari*, to assemble, collect in a crowd.
rikima, now *rikimi*, a lengthened form of *riki*, strength.
norashi, now *norishi*, literally a maker of measurement.
ochi sha, same as *ochi ja*, leave (imperative).

line 4. *arata*, new; the present word for new is *arata-na*, but *arata* forms *arata-me*, to renovate, reform.
adan, now *ada-na*, nickname.
arimaja seems the same as *arimashi*, is to you, without dative sign.
sonaye, *sonayeru*, to set before, offer.

line 5. *tosha*, should be *toshi*, year, probably an error in transcription.
arakiku, lengthened form of *araki*, violent, rude, wild.
sumeshaka should be *sumashika*, from *sumashi*, to finish, end; in the past tense marked by *shika*.
fujune or *fujun*, bad, contrary, unfavourable, adverse.
tomata, now *tometa*, pret. of *tome*; see line 2.
tokiji, from *toki*, time, now abbreviated to *toji*, now.
tokashime or *tokishime*, compounded of *toki*, time, and *shime*, sum, total.

line 6. *akerami* or *akarami*, to become red, to blush.
jagasha, same as *sagesha* of Part I., line 9, to despise.
rakuraku, easy, pleasant, free from pain.
aritaka ji, *aritaki ji*, from *aritai*, *aritaki*, wish to be, let there be, and *ji*, negative future particle (Aston's Grammar, p. 157). The whole will thus read: shall there not be?

line 7. *wabi*, the old word for peace, which is now *wa*, while *wabi* means apology, supplication.
wa, a circle, cycle.
amu, supposed old form of *amashi*, to let remain, leave over.

line 8. *shiki*, now *shika*, so, thus, as.
sumijaji, compound noun, the parts of which seem to be *sumai*, a residence, and *jusho*, having the same meaning.
aruha, now *aruji*, lord, master, landlord, owner.
yajiri, abbreviated form of *yajiri-kiri*, a thief, house-breaker.
yado, house and grounds, home.
mamori, to guard.
kisha by a strange inversion is *kaku*, thus, which, as I pray, the Girnar Japanese makes *kaki*, and the modern, *kashi*.
Buda, the usual form of Budha's name in the inscriptions; in modern Japanese, *Butsu*.
kido should be *kado*, door or gate.
jomaye ji, *jomaye*, a lock; the following *ji* is equivalent to *shi*, do.

[12] Analysis of No. I.

katame, promise, agreement, pledge, vow.
gozari masu, I have, there is (Aston's Grammar, 174).
tsushigo, from *tsuchi*, earth, and *ga*, genitive particle.
tsugo, all.
butsu, to strike, *bushi*, a soldier.
kisafuki, from *kisoi*, to excel. Most Jap. verbs now ending in *oi* and *ai* are abbreviations of older forms in *ofu* and *afu*: the final *ki* is the attributive termination.
go, following names of places, is the genitive *ga*.
mito or *mido*, now *mikado*, honourable door, king—emperor.
futa or *buta*, now *futatsu*, 2: the *tsu* is generally omitted.
ki, sometimes *maki*, Japanese *momochi*, hundred. The short form is the Yeniseian *ki*, *kihe*, *kise*.
2 *fu*: the numeral 2 is expressed by the two lines = , and the following *fu* is an abbreviation of the old word for 20, now *hatachi*, which was probably *futachi*.
Buda go; the latter word is a post-position, after, behind.

[13] Archæological Survey of India, Vol. III., Pl. XV., No. 20, and p. 35.

[14] Analysis of No. II.

line 1. *kumi-wa*, now *kumi-au*, joined together in one company, qualifying *mabu* which is not modern Japanese. A nun is *ama*, and *ambu* is quiet, peaceful, happy. The word occurs in several inscriptions in India and Siberia, and denotes a monk.
hiromeku, adjective or participial form of *hirome*, to spread, publish, proclaim, governing Budha.
tama, abbreviation of *ato-me*, successor.
anoke, compound of *ano*, that, and *ko*, place, meaning, that there.
atsufushi, form of *atsui*, thick large, great, liberal. Final *i* after a vowel generally stands for an ancient *fu*.
magetsu, adjective form of *magai*, imitation, *magaye-ru*, to imitate.
hime, now simply *hi*, a monument: *me*, a common suffix, as in *ato-me*, successor, *kake-me*, weight.
wo, particle specifying the direct object of the sentence, *hime-mire*, to see.
fui ochi; *fui* seems to be the old form of *ho* in *ho-dai*, at liberty, and to have the same meaning: *ochi*, like the Basque *utzi*, means to leave,
tashi-bun; *tasshi-gaki* is a government proclamation, and *bun* or *fumi*, which takes the place of *kaki* or *gaki*, has the same meaning, writing.
tsuku, now *tsukeru*, to affix; *tsuku* is the neuter form.

line 2. *Sibir*, a country, perhaps Cabul.
mafu ketaru, now *katarai*, converse together; *mafu*, a humble word for *ifu*, to say, denoting the subordinate position of Diodotus.
tori-wima, inversion of *hima* or *fima-dori*, to delay, literally, take leisure.
Wata-tami, the Bakhdi or Bactrian *tami*, people.
Doidota, the Sanscrit Devadatta and Greek Diodotus.
ga, the genitive post-position.
wabi, peaceful; see Asoka inscription.
Kitsuuchi, a north-western people, the Khasas.
mito, king, now *mikado*.

line 3. *Gorami*, a king, whose inscriptions show him to have been contemporary with part of the reign of Tsurami or Asoka. He ruled Mekasa, perhaps Massaga of the Assaceni.

yame, now *yamome*, widow or widower, difficult at times to distinguish from the Indo-Hittite *yome*, daughter.

tsutaru, now connected with *tsutawaru*, to inherit, meaning the heir or successor.

betsu, separation, distinction, here answering to *betsu-jo*, special.

sai, wife.

Amrita, a woman's name: Raja Tarangini, L. III., sl. 9, 463, L. IV., sl. 658.

tsuta, for *tsuida*, preterite of *tsugi*, to join.

hime; see line 1.

tatsuri, now *tateru*, but regular transitive form of *tatsu*, to stand.

Part IV. *Tsurami;* see Asoka inscription.

meku maki: me is Indo-Hittite 10, and *maki* 100.

sumara, now *samurai*, a gentleman, one privileged to wear two swords.

kami, lord, ruler.

tsu, old genitive particle.

tsudotatsu seems to be a compound of *tsudoi*, to assemble, and *tatsu*, to stand up. As *tachi, tatsu* is in Indo-Hittite often used transitively; it may here be the verb governing *kifuta* that in the text is supposed to be lost. In this case the passage will read: "Of 1004 nobles of the Kitsuuchi Tsurami summoned an assembly—to set up—the gift of the wife."

wo, the mark of the accusative, often omitted.

yobidata, preterite of *yobi-dasu*, to call out, summon.

nedo, Indo-Hittite and Siberian vulgar term for wife, from *ne, neru*, to sleep, and *do*, together, similar in form to concubine.

kifuta, now *kifu*, a contribution or donation.

[15] Archæological Survey of India, Vol. III., Pl. XV., No. 16, and p. 34.

[16] Analysis of No. III.

line 1. *tsushiku*, now *tsuchi*, earth, the earth.

ga, genitive particle; *mito*, king.

2 maki 2 fu 3; maki 100, *fu* 20.

Buda go, after Budha.

tama, is not *tama*, master, but modern *ato-me*, descendant.

tsuneko, from *tsune*, usual, and *ko*, place, this usual.

fumi, writing.

tsuku, affixes; see above, No. II., line 1.

line 2. *koga*, from *ko*, this, and *ga*, genitive, the demonstrative employed for the possessive adjective of the third person.

sai, wife.

mesume, now *musume*, daughter. This reading is doubtful, as it is the only place in which I have found *mesume*.

tsuta, joined; see No. II., line 3.

dzubotsu, now *sobadzukai*, attendant. Compare *dzusa*, follower, servant, and *dzui-shin*, follower, disciple.

* *ma* * *mu go hu ma*—illegible.

tsuraka, likeness, from *tsura*, the face.

aritama, now *aratame-ru*, renovate.

[17] Analysis of No. IV.

Tsumaki, a king's name.
Tsutaka Saka, a branch of the Sacae.
tsuyoshi, strong, mighty.
yaku, old numeral 1.
hirometu; see No. II., line 1.

[18] Archæological Survey of India, Vol. III., Pl. XIV., No. 11, and p. 33.

[19] Analysis of No. 5.

ma, old form for 10 abbreviated.
tori, take, seize, obtain, admit, select.

[20] Archæological Survey of India, Vol. III., Pl. XIV,, No. 14, and p. 34.

[21] Analysis of No. VI.

goku, sometimes, as now, *goki*, stout-hearted, brave.
agameke, adjective, from *agame-ru*, to exalt, honour.
fu, a chief city.
yobutata, pret. of *yobi-dashi*, call out, summon.
yodatsuta, adj., from *yodatsu*, to be of use.
ashikaze, now *ashigaru*, foot soldiers.
katsu, to conquer.
daman, now *dam-metsu*, to exterminate.
tsutome tatsure, to serve, to set up.
tami ki, people's mind.

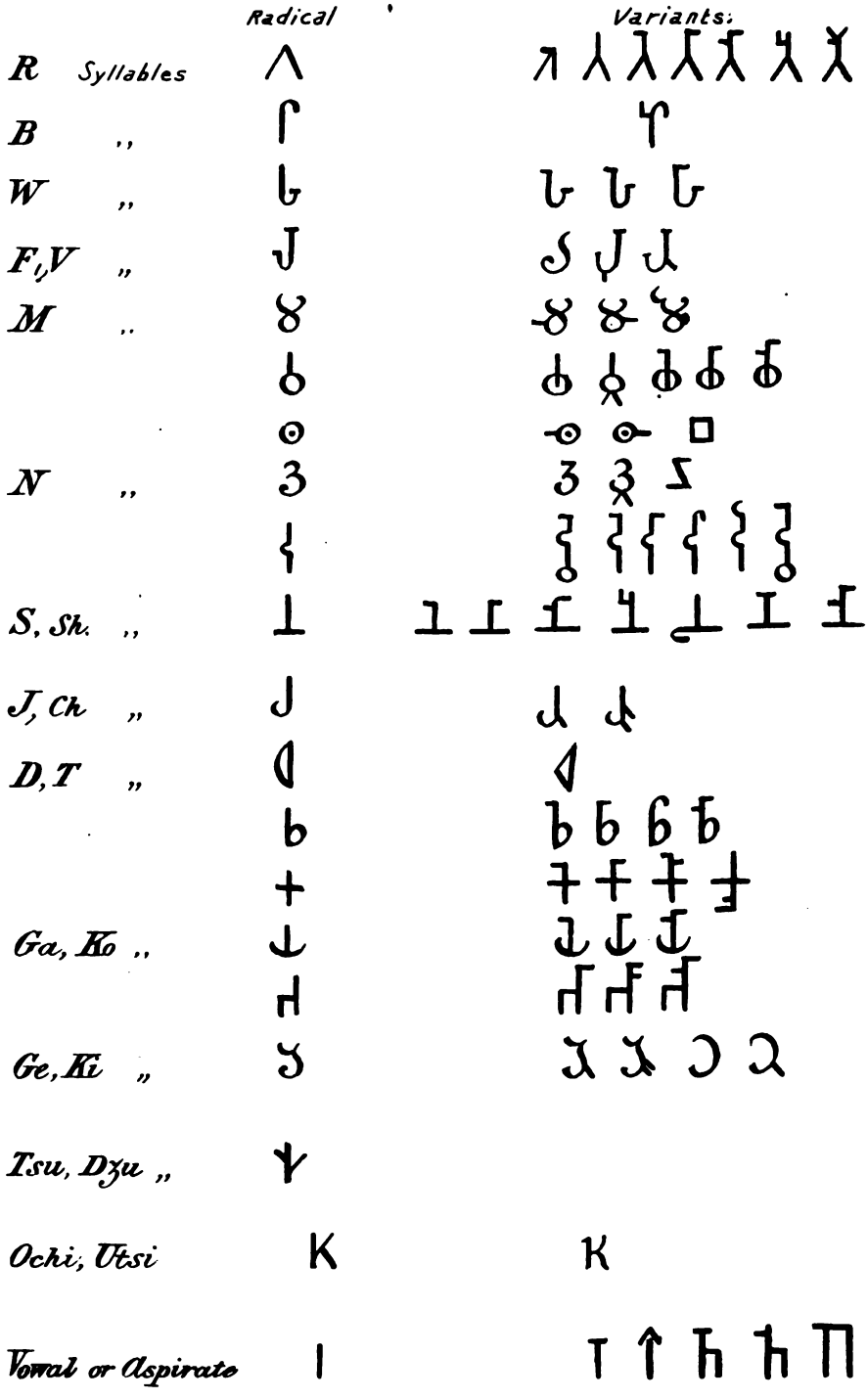
[22] Archæological Survey of India, Vol. III., Pl. XIV., No. 12, and page 33.

[23] Raja Tarangini, L. I., sl. 341; Strabo, XV., l. 30, 31; Curtius IX., 5.

[24] Vishnu Purana, Bk. IV.; Mahavansu, appendices; Arrian, Anab. IV., 22.

[25] Raja Tarangini, L. VI., sl. 188. Vicramaditya was probably a soldier of fortune under Afumi, for the Raja Tarangini makes Abhimanyu the son of Kshema Gupta, while it does not appear that Vicramaditya ever assumed the Gupta name. At the time of Afumi, the Guptas had become *rois faineants*.

PLATE I.—THE SYLLABARY OF THE ASOKA PROCLAMATIONS.



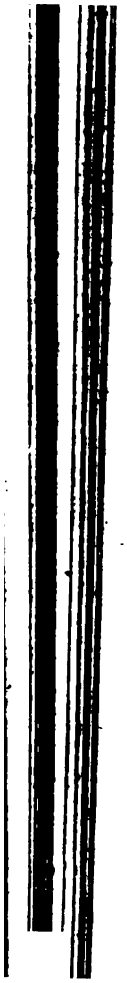


PLATE II.—THE COMMON INDO-HITTITE SYLLABARY.

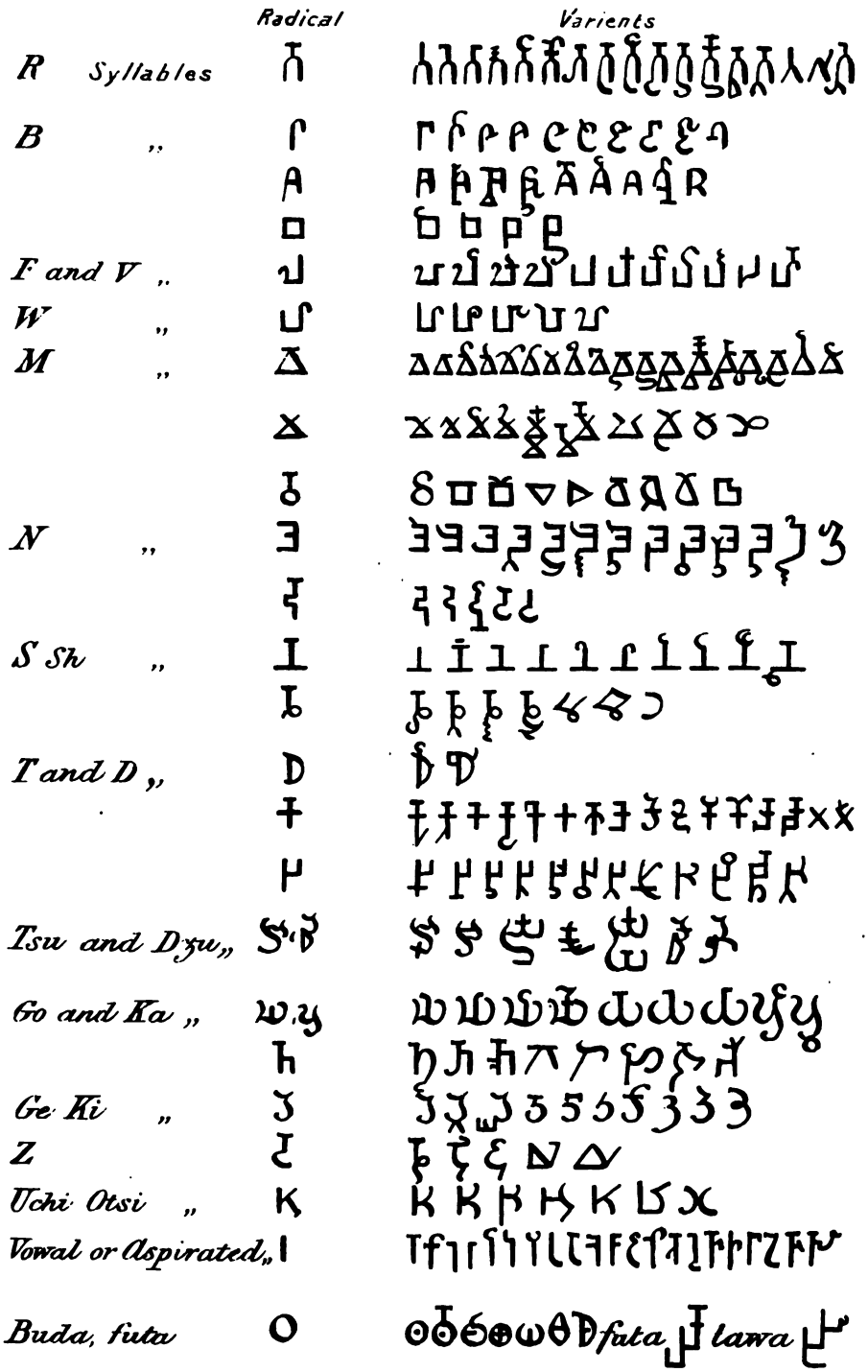


PLATE II.—THE COMMON INDO-HITTITE SYLLABARY.

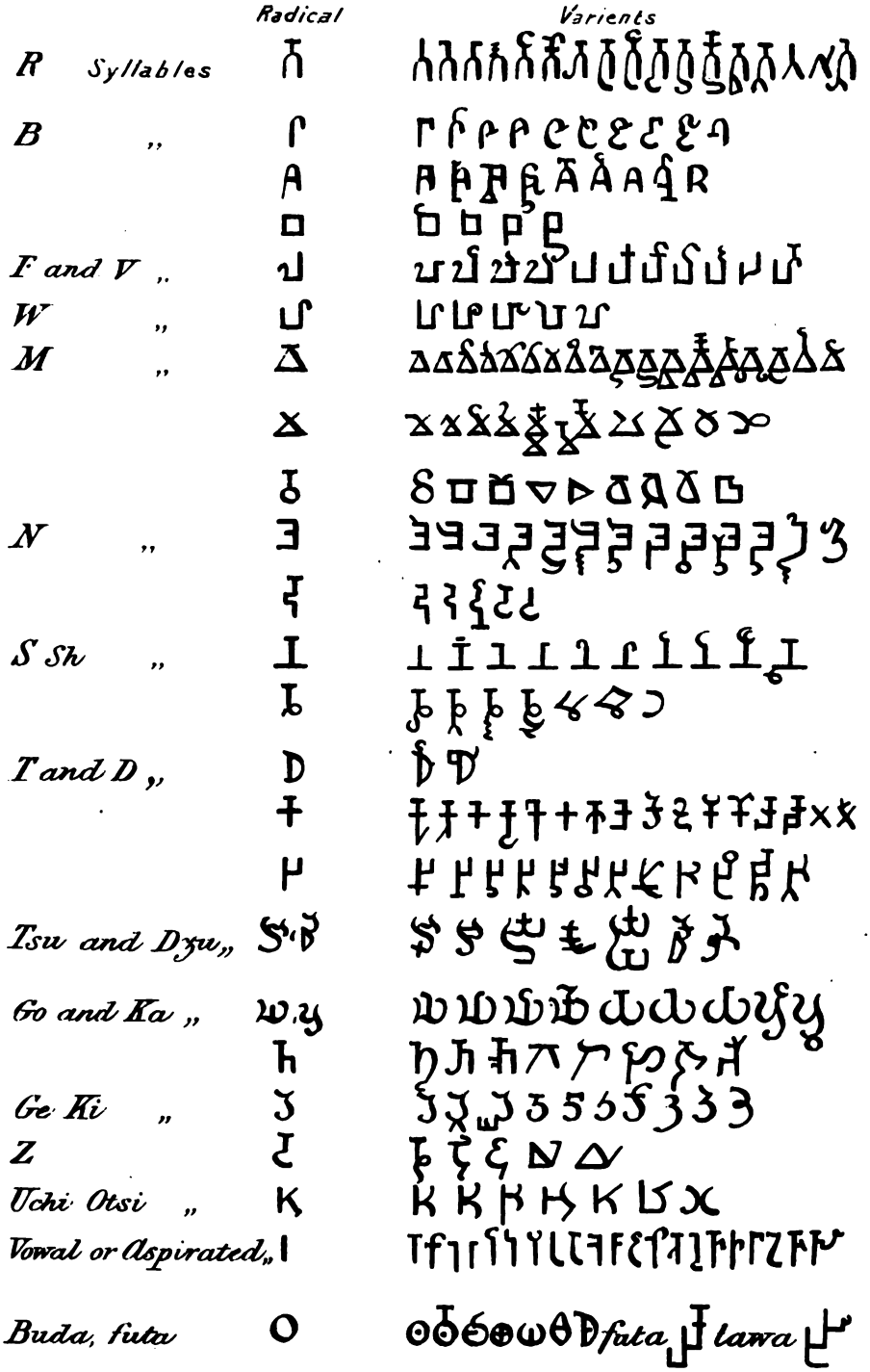


PLATE III.—ASOKA EDICT AT GIRNAR.

PART 1

PART 2

THE JOURNAL OF CAPTAIN WALTER BUTLER, ON A VOYAGE ALONG THE NORTH SHORE OF LAKE ONTARIO, FROM THE 8TH TO THE 16TH OF MARCH, 1779.

By Captain Ernest Cruikshank.

(Read 7th January, 1893.)

Niagara, 8th March, 1779.—Three o'clock in the afternoon, set off for Canada in a batteau. The weather calm, the season very forward and more than common fine, no appearance of snow, ice, or frost. Rowed to the 12 Mile Pond, encamped; saw this evening a large flock of pigeon in trees and numbers of geese and ducks in the pond.

12 Mile Pond, 9th March.—At six put off, the wind and swell high and ahead; but the hands being good oarsmen kept the lake till the 20 Mile Pond or river, when the wind increasing and no harbour nearer than the 40 Mile Creek, made for the Creek and was near striking on the bar, but the force of the waves on the stern and working briskly of the oars got into the river. An Indian cabin on the bank inhabited by Missassaugas. The 20 Mile Creek is a fine stream, though shallow at the entrance and narrow at the mouth, but very wide a little way up. The land in general level, though higher on the east side. Timber—oak, pine and a few chestnut trees. The place appears as the head of the lake, though it turns for forty miles westerly beyond this before the lake turns to the north-eastward. This creek heads near Point Obino, 18 miles above Fort Erie on Lake Erie, likewise the 12 and 16 mile creeks rise out of the swamp near Lake Erie. Boats can go up this creek about 15 miles. Saw a number of blackbirds. 3 o'clock put off, the wind falling, and rowed till four, hoisted sail and continued till six, rowed till 7 o'clock, put in shore and encamped on a low, sandy beach, five miles from the creek in this bay forming the head of the lake, hauled the boat up the distance from the said creek to Niagara, 60 miles.

10th March.—Put off at daylight, every appearance of a fair wind, rowed an hour, the wind came ahead, increased with a high swell, was obliged to put into the river at the head of the lake, shipped water twice before we made the river, the wind at east. From the west side of 20 Mile Creek the land lowers till you come 12 miles off this, where it forms a fine sandy beach with a few trees near the shore, which continues a

mile beyond this where the shore turns and runs about north-east, whence it is a broken shore with a bank of seven or eight feet and no landing with boats for ten miles. In windy weather a boat may go up this river 10 or 13 miles, whence there is a carrying place of 13 miles into the river Tranche, which falls into the lake of St. Clair. After you enter the river about 400 yards it forms a lake or pond of four miles over and six long. Between it and the lake is a narrow neck of land of 400 yards wide, covered with a few trees and reedy grass; on this the Indians hut in the fishing season. This pond in the season has great numbers of all sorts of water fowl. Round this lake or pond a quantity of hay might be made. This morning about seven, the weather being clear and little or no wind, we saw the spray or mist of the Fall of Niagara, being from this about south-east. A canoe with Missassaugas came to us, gave me ducks, in return gave them powder and shot and bread, they being out of ammunition. I learned from them that Joseph Brant had left his boat here and took two canoes 11 days ago.

Head of the Lake, 11th March.—Got up at daylight, wind still ahead and too hard to put out; amused ourselves shooting ducks and blackbirds. Set in raining at ten this morning. An hour before sunset a thunder gust with lightning and a heavy rain. Thick fog and calm, though still a high swell. Set off a little before sunset. Half an hour out fog cleared off with a hard north-west wind very squally, could not sail, rowed till eight o'clock, the wind and swell too high to go any further this night; put into the 12 Mile Creek with much difficulty. Got into the creek, obliged to drag the boat, water sufficient, but a fall in the mouth of the creek; ten o'clock at night before we could kindle a fire; the ground and wood wet; encamped on a bare point. The wind blew down our tent. Up this creek a sawmill might be erected, having fine rapids and good timber for boards. This creek in the fall is filled with salmon, as all the other large runs of water are in the fall season. From Niagara to this the lake shallow near the shore, though good anchoring ground off in the lake.

12th March.—Set off at seven o'clock this morning; the wind at N.W.; too much off shore to sail; rowed till 11 o'clock; put into the river called the Credit, 17 miles from the last station. The shore in general good for boats to land; the land low and a good beach, except the points, which are bluff. Two Missassaugas came to me and informed me a number of them lived up this river. Gave them bread and put off at 12; rowed to the bay above Toronto; hoisted sail: found the wind too high to go round the long point forming the basin or bay below Toronto. Continuing sailing down the bay to the camping place, unloaded the

boat, hauled her over and loaded again in an hour and a half; rowed from this to the beginning of the high lands, encamped on the beach and secured the boat. Toronto was built on a level spot of ground nearly opposite a long narrow neck or point of land running seven or eight miles into the lake, forming a noble bay of eight or nine miles deep, two or three miles from the bottom of which, on the north side, ships can ride in safety. It's strange the French built the fort where they did and not where their shipping were wont to lay, which was a few miles below the fort down the bay. The bay of Toronto was filled with all sorts of wild fowl. Saw on the north side of the bay several wigwams and canoes turned up on shore. The land about Toronto appears very good for cultivation. From Toronto to the river du Credit it is 12 miles across the bay, but better than 20 along shore, which is the way boats must take except the weather is very calm or a light breeze in your favour. From Toronto to the beginning of the high lands is nine or ten miles down the basin, but nearly double round the point.

13th March.—Got off at daylight; the wind from the land, could not sail, rowed till twelve; passed the high lands and a small bay. Put into Pinewood Creek. Here one Duffin resided formerly, since when a Frenchman has resided here. He went off a little before we came. Two houses a little up the creek, one entire, the other stripped. This creek is famous with the Indians for great quantities of fish. The distance from this to the other end of the highlands is about 20 miles, 15 of which are few or no places where a boat could be saved in case of a storm off the lake, the bank being very high and steep, being a mixture of clay and chalk nearly as hard as freestone; it forms a romantic, wild view, in many places appearing like towns in ruins, the relics of houses, remains of chimneys, etc. From the lake you would take it for a large town built of stone partly demolished. Put off at ten o'clock, rowed till three, the wind fair, sailed till four, rowed till six, no wind; put ashore in a deep bay where we found a fine creek, its water as clear as crystal. Encamped a little up the creek in this bay. I believe vessels might ride with safety from the N.E. or N.W. wind, but not from the S.E. or S.W. The distance from this to the Pinewood Creek is about 30 miles, the lake all along forming small bays in which you have a good beach in which a boat may be secure in case of a storm.

14th March.—Set off at daylight; rowed till twelve; the swell increasing with the wind ahead at east, put into a creek called by the Indians Pamituscoteyank (the fat fire); the distance from our encampment 15 miles; at this creek and two others nearly of the same name

the Indians in the fishing season reside.* All those three creeks head near a lake about 30 miles long, distant from this about 50 miles where the Missassaugas have two villages and where the Canadians in winter send traders. Expresses in winter pass this lake on their way to Canada. Set off at one o'clock, the wind off shore, rowed till two; sailed till night; put into a deep bay; found a creek but could not get in, the stream running very rapid; rowed further in the bay and encamped on the beach; secured the boat. From the Fat Fire Creek to this about thirty miles, the shore and particularly the bays level, and good beaches for boats to land and the points bluff, the lake shoal near the shore.

15th March.—Put off as soon as day appeared and rowed till ten; passed a long point which forms two deep bays, one on either side, of ten miles to the bottom. In the bay to the west falls one of the creeks before mentioned, coming from near the small lake inhabited by the Missassaugas. In those two bays vessels might lay secure from storms on the lake, in the west bay sheltered from the S.E. and N.E. winds, in the east from the W. and N.W. winds. The point runs direct into the lake for four miles at least. You can't see the bottom of the east bay in passing across from the end of the point to the main. This bay has a fine river falling into it from the east, which forms a basin and a narrow entrance into it, occasioned by a narrow neck or sandy beach between the lake and river. At 11 o'clock hoisted sail, the wind off shore; at 10 o'clock passed two islands, the one called St. Nicholas, the other never knew a name nor did I know there was one of St. Nicholas; St. Nicholas is about one half a mile in circumference, the other about half that size. St. Nicholas is about one mile from shore, the other much smaller and about two miles beyond it directly out into the lake, either of which would be a safe retreat for vessels in a storm, these islands are about 12 miles east of the beforementioned point forming the two bays. When the wind is high the boats go within two miles of the bottom of these bays and drag the boats across a point of land about 200 yards wide. The distance from our encampment to the point about 12 miles, from the point to St. Nicholas Island about 10 miles. Continued sailing till night, put in shore and encamped on a low point where we found a fine creek and a good harbour in a pond for our boat. Since this morning a great number of wild fowl. From the island to this is about 25 miles; the shore much the same as yesterday, the points not so bluff.

March 16th.—Put off our boat very early, much ice which had formed last night, the wind ahead and partly from the shore which partly drove

* Long, in his travels, p. 78, and elsewhere, mentions this place by the name of Pimistiscotyan Landing. He apparently resided there for some time.

the ice into the lake; rowed till 9 o'clock; came up to the Duck Islands and saw the islands called the False Ducks about south from the real Ducks; the distance I take to be better than 12 miles between the real and the False Ducks as they appear from here. The vessels, if I remember well, made the distance more. Those islands afford a safe retreat for vessels in case of a storm. The islands are much alike, about a mile round and nearly circular distant from the main, four miles and from each other one. The weather calm, rowed across a very deep bay of 20 miles down and about ten directly over. This bay is much larger if taken from the point of a large island to the east and the Ducks to the west part of the main, and the large island on the east side of the bay from the Ducks appears like a number of small islands and in many places a single tree is only seen. Many persons not acquainted with the passage have taken down the bay supposing it to be the entrance of the river, and in coming from the river have imagined the main to the west to be islands from its appearance, and go likewise down this bay. Traders go in two days to the before mentioned small lake inhabited by the Missassaugas. Continued rowing till the mouth of the Caderouqua Bay, the wind coming fair sailed into Caderouqua harbour. The distance from our encampment to Caderouqua about 32 miles, the land in general very low and swampy back; the points rocky and shallow for some way out. There is so much of a sameness in the appearance of the land from the highlands to the river that a few miles off in the lake there is no knowing one place from the other. Nothing but the walls of the barracks and houses remain of the Fort. It appears never to have been a place of strength, neither do I think its situation will admit its being made so, the land very stony and ground back to command it. It has a fine safe harbour for shipping. The little island opposite the Fort improved in the French time is now covered with small trees.

I am told vessels cannot sail out of Caderouqua to the lake but with a north or north-west wind. An east and south wind are fair winds for ships once clear of the river to Niagara. The above are all the observations I made on the north shore of Ontario, which would have been more perfect but for the severity of the weather, which prevented me taking notice of many parts of the shore, neither did I think these remarks would have been seen or would have been more particular.

MEMOIR OF CAPTAIN WALTER BUTLER.

BY CAPTAIN ERNEST CRUIKSHANK.

(Read 7th January, 1893.)

Walter Butler, the author of the foregoing journal, was a man of sufficient note to receive mention in nearly every history of the American Revolution and most of the larger histories of the United States as well. Unfortunately for his reputation, the story of his share in the struggle has invariably been written from a hostile point of view. By his enemies he was regarded as a fierce, cruel, and implacable adversary, delighting in bloodshed and ruin. What he seemed in the eyes of his friends and comrades has never been told.

The eldest son of Lieut. Col. John Butler, afterwards so widely-known as the commandant of the famous corps of rangers bearing his name, he is supposed to have been born about the year 1750 on his father's farm of Butlersburg, in the valley of the Mohawk, near Johnstown. At the outbreak of the revolutionary movement he was, therefore, about twenty-five years of age, and had been admitted to the bar of the Province of New York. Judge Jones, the author of a history of New York during the Revolution, who knew him as a law student, describes him as "a youth of spirit, sense, and ability." Another authority speaks of him as a "pretty able young lawyer." His name appears as one of the two attorneys who signed the protest of the Loyalists of Tryon County in March, 1775. During the summer of that year he accompanied Guy Johnson to a Council of the Six Nations at Oswego, and afterwards went with him to Montreal to aid in the defence of Canada. His zeal and activity as a Loyalist must have already given him some prominence, as popular rumour named him as one of the leaders of the Indians who were expected to make a descent upon the Mohawk valley at that time.

Very shortly after his arrival at Montreal he received a commission from General Carleton, the governor of the province, as ensign in the 8th or King's regiment. In company with Lieut. Peter Johnson of the Indian department, he gained distinction in the skirmish on the island of Montreal, which resulted in the defeat and capture of Ethan Allen, by leading a party of thirty rangers and Indians against the flank of the enemy at a critical moment. This movement threw them into confusion and decided the fate of the day. The traveller Long names the same

two officers as being in command of a small party of whites and Indians of whom he was one, that defeated a superior force of Americans near Isle Aux Noix soon afterwards, taking many prisoners. Butler then drops out of sight for a year.

He appears to have gone with his father to Fort Niagara, where a part of his regiment was stationed, and remained there until the spring of 1777. The monotony of garrison duty in a lonely frontier fort became insupportable and he begged eagerly for employment in the field. Carleton wrote approvingly in reply to Captain Lernoult (2nd February, 1777,) "Ensign Butler has testified a desire to serve, for which he is much to be commended, and as he seems a promising young man, in case any part of the regiment moves in the spring, I should be glad he was to accompany them." Accordingly he was one of the officers of that regiment selected for the expedition against Fort Stanwix in the summer of that year. In July he was appointed captain of a company of Loyalist refugees enlisted by his father to serve as rangers with the Indians and with the special object of "controlling and restraining them from committing acts of cruelty." In command of this he took part in the bloody battle of Oriskany, in which General Herkimer's relieving force was defeated. His knowledge of the country and the people then caused him to be selected by Colonel St. Leger to carry a flag of truce and a proclamation of amnesty to the inhabitants of the German Flats who were reported to be anxious to return to their allegiance. A large number of these had accordingly assembled at the house of Rudolph Shomaker, a magistrate and a Loyalist, but who had remained inactive, within two miles of Fort Dayton, and Butler was addressing the gathering when the house was surrounded by the advance guard of General Arnold's army on its march to relieve Fort Stanwix and he was taken prisoner with the whole of his party. Heedless of his flag of truce and the purpose of his visit, Arnold directed him to be tried by a drum-head court-martial as a spy. That compliant tribunal promptly found him guilty and sentenced him to death although he produced his instructions and commission as an officer of the British army. Arnold at once approved their finding and ordered the sentence to be executed next morning. But a number of officers of the 1st New York regiment startled at such severity petitioned for a respite, which was finally granted, and he was sent a close prisoner to Albany. He was there confined in a small and filthy cell in the common jail, heavily ironed and treated with the utmost harshness. In the course of some months he became seriously ill. Col. Butler declared his belief that he was treated with such extraordinary severity simply because he was his son, and naturally made every effort to obtain his exchange. Fortunately, General

Schuyler, whose enmity to the Loyalist party was most bitter, was relieved about that time by the Marquis de la Fayette in the command at Albany. A number of the inhabitants who had known Walter Butler as a student in that town, sympathizing with his sufferings, seized the opportunity to petition for his removal to more comfortable quarters. They asserted that his life would be in great danger if he remained where he was much longer. He was soon afterwards removed to a private house under a strong guard. The sentence of death, however, still remained suspended over his head. About the end of April, 1778, he made his escape; a horse was provided for him by his friends and he rode out a free man into the valley of the Mohawk, where all the roads were known to him from boyhood. Although weak and greatly emaciated, he accomplished the perilous journey of nearly four hundred miles to Fort Niagara in safety, At the Seneca village of Canadasaga (near the present town of Geneva. N.Y.) he found his father encamped with his corps of rangers swelled by new recruits to upwards of 200 men. Col. Butler was preparing for his descent upon Wyoming, but observing that his son was quite unfit for service in the field, he despatched him to Quebec in the hope that the journey would re-establish his health. He travelled swiftly. On the 17th of May he arrived at Niagara; on the 4th of June he laid before General Haldimand, in Quebec, a careful memorandum describing the movements of the rangers and Indians, and stating his father's proposals for adding two companies of French Canadians to his regiment, for the purpose of counteracting the efforts of La Fayette and other French officers to detach the Six Nations.

Sir John Johnson's correspondence with his brother-in-law, Daniel Claus, throws some striking and suggestive light upon the heartburnings and intrigues which prevailed among the Loyalists themselves. The letters of both constantly breathe a spirit of most intense hostility to the Butlers.

On the 29th of June, Johnson wrote:—"Young Butler attends at Headquarters constantly, though I cannot perceive there is any great notice taken of him. He says he waits orders before he can proceed up the country. I should be sorry his flight should occasion the death of any of our poor friends."

Again, on the 16th of July, he said:—"I have given him (General Haldimand) a very plain and honest account of Butler and his son, not concealing a single circumstance of his whole conduct which has come to my knowledge, and I think I can discern that a change in his opinion of this great man's merit and services will surely take place, if not already the case. He asked me yesterday what he would be about all this time;

that he thought he would have struck a blow ere now. I told him I thought I might venture to assure him that it was not his intention ; that he would remain where he was or thereabouts till he could join the army from York with safety, or till it would be too late to do anything. He told me the other day that young Butler was a pretty genteel man. I took the opportunity to give my opinion of him pretty freely."

Walter Butler did not return to Niagara till the end of July, and consequently had no part in the destruction of Wyoming. Soon after he joined his company at Oquaga, an Indian village near the east branch of the Susquehanna, his father was forced by a severe attack of rheumatism in the head to hand over to him the command of the entire corps and leave the Indian country altogether for the remainder of the year. During August, the main body of the rangers remained in the vicinity of Oquaga in readiness, if a favourable opportunity offered, to make a raid on the enemy's frontier, or if need be to protect the Indian villages from attack, but their scouts and reconnoitering parties ranged the entire border from the Susquehanna to the Mohawk and Oswego. Early in September an avenging force from Wyoming advanced in the direction of the Seneca country, but retired after burning two small villages before Butler could gather a party strong enough to attack it with any prospect of success. When he found that the invaders had evaded pursuit he sent Captain Caldwell with the main body of the rangers to destroy the German Flats, where extensive magazines of provisions had been formed for the supply of the enemy's army and garrisons in New York. This was swiftly and thoroughly accomplished without the loss of a man. During Caldwell's absence Butler continued to collect the Indians and enlist recruits for the rangers, with the intention of dealing a still more effective blow at Cherry Valley, where a great quantity of grain and many cattle were collected for the use of Washington's army. This movement was delayed by the sudden advance of a second column of nearly 1400 men from Wyoming which reached and destroyed the village of Oquaga, but then hastily retired. Captain Butler had awaited the invaders' approach at Canadasaga, where he was joined by 400 Senecas and a few volunteers from the King's regiment in garrison at Fort Niagara. When the Americans commenced their retreat he felt that the time had arrived for his counter-stroke at Cherry Valley, if it was to be executed that year, for it was already the beginning of November. The forest paths were fast becoming impassable, and the settlement he designed to attack lay within sixty miles of Albany. He began his march at once with 200 rangers and volunteers and 321 Indians. The journey was tedious and fatiguing from the condition of the roads and stormy weather. On the 9th of November they met and captured the whole of a scouting party,

composed of a sergeant and eight men sent out from Cherry Valley, by whom they were informed that the garrison, consisting of a Massachusetts regiment of continentals, numbering 300 men and 150 local militia, occupied a strong palisaded fort near the centre of the settlement, but that most of the principal officers lodged in a house about a quarter of a mile outside its walls. They had already been warned of Butler's approach by an Oneida Indian, but apparently felt quite secure against any attack.

When darkness overtook Butler's party next evening they had advanced by a forced march within six miles of the fort, and he proposed to the Indians that as soon as the moon rose they should make a dash forward and surround the officers' quarters while he attempted the surprise of the fort itself with the rangers. To this the chiefs readily agreed, but it then began to rain heavily, and the Indians at once scattered for shelter in a pine wood and obstinately refused to move an inch till morning. It was then decided to send Captain McDonnell with fifty picked rangers and a body of Indians to surround the house where the officers lay and cut off all communication with the adjacent settlement, while Butler himself, at the head of the remainder, made a rush for the fort. They had advanced with this intention quite unobserved along a bye-path until within a mile of the place, when some Indians in front fired at two men cutting wood. One of these escaped, although badly wounded, and gave the alarm by his cries as he ran. The remainder of the Indians rushed off in pursuit as soon as they heard the sound of the firing and gained a long start of the rangers, who were halted for an instant by their officers to reprime their rifles. The major of the Continental regiment, with one or two others, succeeded in getting into the fort, but Colonel Alden, five other officers, and twenty men were killed in the attempt, and Lieut.-Col. Stacy, three subalterns, and ten privates were taken prisoners. The colours of the regiment were abandoned in the house and burnt with it in the general scene of destruction which followed. The garrison of the fort, to favour the escape of their officers, opened a fire of both cannon and musketry upon their pursuers, and although this was briskly returned by the rangers for ten minutes all hope of taking the place was seen to be futile.

In spite of the greatest efforts on the part of the officers in charge of them the Indians at once dispersed in small parties, killing the inhabitants or taking them prisoners, and plundering or burning their houses. A vigorous sally of even a small part of the garrison might be sufficient to drive the whole in headlong flight from the valley. To guard against the evident danger to which they were exposed by their own heedless-

ness and misconduct, as well as to provide for the safety of his own men, became Butler's first duty in this distressing situation. He quickly assembled the rangers; and after destroying an abandoned blockhouse, took possession of a rising ground near the fort. It was then about noon, and he found it necessary to retain possession until nightfall, while his men were stiffened with cold and drenched by the pitiless November rain. Meanwhile the valley for many miles was ablaze with burning houses. Released from the constraint imposed upon them by the presence of the troops, the Indians quickly threw off the control of their chiefs, and the handful of white officers attached to them, and began to execute indiscriminate vengeance for the recent destruction of their villages. Many of the hapless inhabitants, including some women and children, were killed, and the lives of the remainder saved with much difficulty. When at last night came, Butler ventured to retire about a mile, having for six hours overawed by his defiant attitude a force of at least double his numbers, which had every incentive that passion could furnish to leave their intrenchments and attack him. He next rescued as many of the prisoners as possible from the hands of their captors. Large fires were built for their comfort, and they were protected by a strong guard during the remainder of the night.

At day-break, Captain McDonnell, with fifty rangers, and Brant with an equal number of Indians, were despatched to complete the work of destruction. The remainder of the Indians and the weakest men among the rangers were directed to begin their retreat in charge of a great herd of captured cattle destined for the supply of the famished garrison of Fort Niagara. The main body of the rangers was formed near the fort to repel a sortie. But even the sight of fresh ravages failed to draw out the garrison, and when at length every building outside the fort was consumed, Butler quietly began his homeward march. So slight had been the resistance they encountered that only two rangers and three Indians were wounded.

Before he finally left the valley Butler released seven men, ten women, and thirty-two children whom he had recovered from the Indians with a letter addressed to General Schuyler, in which he said :—

"I am induced by humanity to permit the persons whose names I send you herewith to remain, lest the inclemency of the season and their naked and helpless situation should prove fatal to them, and expect that you will release an equal number of our people in your hands, amongst whom I expect you will permit Mrs. Butler and family to come to Canada, but if you insist upon it, I do engage to send you moreover an equal number of prisoners of yours taken either by the

rangers or Indians, and will leave it to you to name the persons. I have done everything in my power to restrain the fury of the Indians from hurting women or children, or killing the prisoners who fell into our hands, and would have more effectually prevented them but they were so much incensed by the late destruction of their village of Oquaga by your people, and shall always continue to act in that manner, as I look upon it beneath the character of a soldier to wage war upon women and children.

"I am sure you are conscious that Col. Butler or myself have no desire that your women or children should be hurt.

"But be assured, sir, that if you persevere in detaining my father's family with you that we shall no longer take the same pains to restrain the Indians from hurting prisoners, women and children, that we have hitherto done."

In his despatch to Colonel Bolton, he frankly admitted the shocking misconduct of the Indians. "I have much to lament," he stated, "that notwithstanding my utmost precautions and endeavours to save the women and children, I could not prevent some of them falling victims to the fury of the savages. They have carried off many of the inhabitants and killed more, among them Colin Cloyd, a very violent rebel. I could not prevail on the Indians to leave the women and children behind, though the second morning, Captain Johnson (to whose knowledge of the Indians and address in managing them I am much indebted) and I got them to permit twelve who were Loyalists, and whom I had concealed with the humane assistance of Mr. Joseph Brant and Captain Jacobs of Oquaga, to return. The death of the women and children upon this occasion may, I believe, be truly ascribed to the rebels having falsely accused the Indians of cruelty at Wyoming. This has much exasperated them, and they are still more incensed at finding that the colonel and those who had laid down their arms, soon after marching into their country intending to destroy their villages, and they declared they would be no more falsely accused of fighting the enemy twice, meaning they would not in future give quarter."

Apparently the only reasonable foundation for the odium which has been so long attached to Walter Butler's name, is the charge that he connived at, or it is even said, encouraged the cruelties of the Indians on this occasion. This he indignantly and vehemently denied at every opportunity. When at length a tardy reply was received from General Clinton in February, 1779, to his letter to General Schuyler already cited, levelling a distinct accusation against him and other officers, but

assenting to the proposed exchange of prisoners, he warmly replied at once in these terms :—

" We deny any *cruelties* to have been committed at Wyoming, either by whites or Indians; so far to the contrary that not a man, woman or child was hurt after the capitulation, or a woman or child before it, and none taken into captivity. Though, should you call it *inhumanity*, the killing *men in arms in the field*, we in that case plead guilty. The inhabitants killed at Cherry Valley do not lay at my door; my conscience acquits me. If any are guilty (as accessories) it is yourselves; at least the conduct of some of your officers. First, Col. Hartley of your forces sent to the Indians the enclosed, being a copy of his letter charging them with crimes they never committed, and threatening them and their villages with fire and sword and no quarter. The burning of one of their villages, then inhabited only by a few families—your friends—who imagined they might remain in peace and friendship with you, till assured a few hours before the arrival of your troops that they should not even receive quarter, took to the woods; and to complete the matter, Colonel Denniston and his people appearing again in arms with Colonel Hartley, after a solemn capitulation and engagement not to bear arms during the war, and Colonel Denniston not performing a promise to release a number of soldiers belonging to Colonel Butler's corps of rangers, then prisoners among you, were the reasons assigned by the Indians to me after the destruction of Cherry Valley for their not acting in the same manner as at Wyoming. They added that being charged by their enemies with what they never had done, and threatened by them, they had determined to convince you that it was not fear which had prevented them from committing the one, and that they did not want spirit to put your threats against them in force against yourselves.

" The prisoners sent back by me, or any now in our or the Indians' hands, but must declare I did everything in my power to prevent the Indians killing the prisoners or taking women or children captive, or in any wise injuring them. Col. Stacy and several other officers of yours when exchanged will acquit me, and must further declare that they have received every assistance before and since their arrival at this post that could be got to relieve their wants. I must, however, beg leave by-the-by, to observe that I experienced no humanity or even common justice during my imprisonment among you."

There seems to be no just reason to doubt the truthfulness of his defence. Even had he been abnormally deficient in humanity the simple fact that his mother, three brothers, and a sister were held as hostages by his enemies, besides fifty other women belonging to the families of some

of the principal officers of the rangers and Indian department, must have operated as a powerful motive to induce him to exercise all possible restraint upon the Indians, and his instructions were most direct and explicit upon that point.

Owing to the lamentable slaughter attending it, General Haldimand expressed but a qualified approval of the expedition, while he warmly commended the conduct of its leader. In a letter to Colonel Butler of the 25th December, 1778, he said:—"I have received Captain Butler's relation of the operations at Cherry Valley, the success of which would have afforded the greatest satisfaction if his endeavours to prevent the excesses to which the Indians in their fury are so apt to run, had proved effectual. It is, however, very much to his credit that he gave proofs of his disapprobation of such proceedings, and I hope that you, and every officer serving with the savages, will never cease your exhortations till you shall at length convince them that such indiscriminate vengeance even upon the cruel and treacherous enemy they are engaged against, is as useless and disreputable as it is contrary to the disposition and maxims of the king in whose cause they are fighting."

In March, 1779, Captain Butler was again despatched to Quebec with the pay-lists and accounts of his regiment. It was during this journey that he made the notes which have been already read. On the 10th of May he touched at Carleton Island on his return. Ten days later he was again at Fort Niagara. When he arrived, his father, with the main body of his corps was a hundred miles away in the heart of the Indian country, and Col. Bolton, having been informed that an expedition was preparing at Fort Pitt against Detroit, directed him to proceed at once to the latter place with twenty-five rangers in the hope of rousing the western Indians for its defence. Later information changed his route in the direction of Venango and Presque Isle for the purpose of alarming the garrison of Fort Pitt. He appears to have spent the month of June among the Indians of the Ohio or in hovering on the western frontier of Pennsylvania, but before the middle of July he rejoined his father at Canadasaga. When he arrived there he found that many of the Indians were absolutely starving, and the rangers were living on scanty supplies of salt provisions brought painfully by batteaux and pack-horses from Niagara. At length, when his men were suffering "everything that hunger and disease could inflict," and being reluctantly driven to the conclusion that if they remained there any longer they must soon become totally unfit for duty, Colonel Butler instructed his son to take command and march to the Falls of the Genesee while he remained alone among the Indians and undertook the difficult task of

keeping them in spirits. The place selected for the encampment of the rangers was much more convenient for the supply of provisions from Niagara, and fish abounded in the river. There is yet in existence a laconic note, written by Walter Butler at this place on the 3rd of August, 1779, to Francis Goring, at Fort Niagara, in which he says:—

"I am obliged to you for the hooks, for sure it is that he that will not hunt or fish, must not eat."

While encamped at the Genesee he learned with great indignation and pain that Lieut. Henry Hare and Sergt. Newberry, of the rangers, had been taken prisoners while scouting and hanged in cold blood by the enemy in front of Hare's own house. In the heat of his resentment he penned a strong remonstrance to General Haldimand, protesting that unless steps were taken by him to restrain the enemy from the commission of such barbarous deeds the rangers themselves must be forced to retaliate in self-defence.

The advance of General Sullivan's army compelled him to march hastily to the Chemung river to oppose the invaders. On the 15th of August the rangers were encamped at Chuckmet, within fourteen miles of the enemy. On the 29th, he commanded them in the battle near Chemung, or Newton, and when forced to retire by superior numbers brought them out of action with very slight loss, although at one time nearly surrounded. On the 10th of September he was at Canadasaga with Rowland Montour and a handful of Indians watching the movements of the Americans, and covering the retreat.

In November, he again accomplished the fatiguing journey to Montreal to settle the regimental accounts; and to facilitate the exchange of his father's family, which had at length been arranged. On this occasion he was accompanied by Captain John McDonnell, of the 84th, then serving with the rangers. One of Butler's letters gives a stray glimpse of their life in that town during the winter. "We do little else but feasting and dancing," he remarked, with heroic disregard of the English grammar "It has nearly turned my head; I find it as hard as scouting. In order to change the scene, McDonnell and me intend to make the tour of the mountain every other day on snowshoes."

McDonnell returned to Niagara early in the spring of 1780, but from some unexplained cause, probably ill-health, Butler was detained at Montreal until the beginning of July. However, on the 24th of that month he was again at Fort Niagara, busied in building quarters for his regiment. Apparently his health was too much impaired to permit him to take the field, and on the 30th of September, on the eve of a most

important raid upon the Mohawk Valley, in which the entire available force of the rangers was engaged, his father stated that he was so ill that he had given him permission to go down to Montreal. In December he returned, and spent the winter at Fort Niagara. In April, 1781, he again went down on regimental affairs.

On the 30th May, he informed Major Matthews that he had arrived at Niagara in eight days from Montreal. "The journey has fatigued me not a little," he added, "and returned the ague on me, but this I owe to falling into the water more than travelling. However, I am feeling better, and I hope with care and thinking that something may be done in the active line in some part of the province to get the better of it, but I fear we shall be idle in this quarter. Clark is not in earnest. Should Allen and his Green Mountain Lads return to their duty I would wish, if it would be for the good of the service, a few companies of the rangers were sent to join them. I should like the service, as being convinced we should be doing essential service in that quarter. I have now given over all prejudices against serving with persons who were formerly our enemies. The good of the service requires we shall give up sentiments of this kind."

In July, he again earnestly entreated to be ordered on active service. A few weeks later he complained with bitterness that "the rangers are made drudges of for Mr. Stedman (contractor at the portage) and others."

After months of weary waiting the coveted opportunity for seeking distinction arrived. In the beginning of October he was ordered to take command of a detachment of ten officers and 160 men of the rangers, and join Major Ross at Oswego, for a descent on the Mohawk Valley. The particular object of this expedition was the devastation of the country at Duanesboro', within eight miles of Schenectady, the only part of the entire valley that had hitherto escaped the ravages of war and which, indeed, was thought by its inhabitants to be perfectly secure from invasion, lying in a central situation between that town, Fort Hunter and Schoharie, all of which were strongly garrisoned and fortified. Consequently the attempt would be attended with great hazard. The force employed consisted of 420 soldiers of six different corps and a hundred Indians. Success and even the lives of the party must depend on the speed and secrecy of their movements. The soldiers were all picked men, selected with an eye to their marching qualities and the endurance of fatigue, but the Indians were the "refuse of the tribes."

Their orders were to destroy effectively "all kinds of grain and forage, mills, etc., and all articles which can contribute to the support of the

enemy. They will as usual have the strongest injunctions to avoid the destruction of women and children, and every species of cruelty."

After a harassing march of eight days, in most distressing weather, they gained the Mohawk River by a very circuitous and unfrequented route, as much to the surprise of the panic-stricken inhabitants as if they had sprung out of the earth itself, although they had been forewarned of their arrival at Oswego. Their appearance at Corrystown on the morning of the 24th October was known in a few hours in all the surrounding forts. There they took a number of prisoners, by whom they were informed that there were 600 militia and 400 regular troops at Schenectady, 500 at Schoharie, and 400 more at Canajoharie, besides garrisons in twenty or more smaller forts along the river. They were consequently threatened by the attack of a force at least four times their number and in a manner surrounded by enemies. Major Ross saw that he must make a forced march during the night if he hoped to reach his destination unmolested. The rain fell in floods and the roads were rapidly becoming almost impassable for his jaded troops, still the fourteen miles that lay before them were accomplished before dawn, but although they struggled manfully to keep together and help along their weaker comrades, several became so completely exhausted that they had to be left by the roadside to the tender mercies of an exasperated enemy. They were allowed to rest on their arms for an hour, and at daybreak the work of destruction began. The Indians and a party of rangers were detached for this purpose, while the remainder of the column marched along the road to support them. The settlement was found entirely deserted. By ten o'clock the devastation of the country for seven miles along the river was completed. Three mills, a public granary, a hundred farm houses with their out-buildings were in flames. The troops then reassembled about twelve miles from Schenectady and retraced their steps to Fort Johnson. Shortly after noon they crossed the river there with some difficulty, as the garrison sallied out to oppose the passage, but the commanding officer being killed his men retreated hastily to the shelter of their works. The British column then marched rapidly through the streets of Johnstown under fire from the stone jail as they passed, and halted in the fields beyond the hall for an hour or two to collect provisions. Major Ross then directed Captain Tice with the Indians to lead the way by the nearest route to Carleton Island, carefully concealing his intention from all others to prevent deserters or prisoners giving information to the enemy. He had sent out scouting parties but they failed to gain any intelligence of the movements of the enemy. However, Colonel Willett, who had advanced to Caughnawaga with 500 regulars and a hundred militia the day before, was already close in pursuit. The Indians

had penetrated about a mile into the forest back of Johnstown, and the rear of the column was just entering it, when this force appeared in such a position that Ross saw that he must fight or permit the rear-guard to be cut off. Accordingly he hastily formed his men to receive the attack about a quarter of a mile after entering the woods. Exclusive of the Indians, very few of whom could be induced to return to the fight, he had 354 officers and men in line.

Willett's force had been largely increased during his advance by the junction of fresh troops from Schenectady and other places, and had become so numerous that he was enabled to detach a large party by a path through a swamp to turn the flank of the British and cut off their retreat. His scouts on penetrating the woods were greeted by a volley from the rangers and Indians, who charged at once with their usual yells and whoops and drove them headlong into an open field where the main body was drawn up with two field pieces. Pressing forward rapidly in support, Ross charged it with his entire force and Willett's men instantly gave way, abandoning one of their guns and much ammunition. In the pursuit, which was continued for half a mile, a number of prisoners was taken and many were killed, others owing their escape solely to the weariness of their assailants. So complete was the rout that Major Ross asserted that if the Indians had behaved with any spirit at this moment he could have "crushed the spirit of the rebels on the Mohawk."

As it happened, few of the Indians ventured to leave the shelter of the woods. Colonel Willett with that part of his force which still remained unbroken took up a new position on a rising ground on the flank of the rangers, whence he annoyed them so much by the fire of his remaining field piece and musketry that they were forced to discontinue the pursuit and return to dislodge him. While hotly engaged with this body, the detachment Willett had sent to intercept their retreat issued suddenly from the woods on their right and rear. Obliged to face about to oppose this fresh attack, they drove this party back into the woods, from which, however, they kept up an intermittent but harassing fire for some time. They were briskly pursued and nearly surrounded, but darkness enabled most of them to escape. On this Willett retreated to Johnstown, re-crossed the bridge, and occupied the stone church built there by Sir William Johnson, where he stood on the defensive. The actual loss of the British in killed and wounded was trifling, but about twenty men were so completely worn out by hunger and fatigue that they were unable to continue the march.

The next morning Major Ross resumed his retreat, but owing to the weariness and half-starved condition of his men, who were then put upon

a daily allowance of half a pound of horseflesh and a few handfuls of corn, his progress was necessarily very slow. On the third day they struck the trail leading from the German Flats to Carleton Island, in the midst of a blinding snow storm. The Indians then parted company, taking the direct road to Oneida Lake to recover their boats. Meanwhile Willett had followed in pursuit with 500 picked men, including many Oneida Indians, and when Ross was preparing to cross Canada Creek, appeared unexpectedly in his rear. Captain Butler with a few of the rangers promptly engaged the pursuers to cover the passage of the stream, then much swollen by rain. In the performance of this service he was killed, with three of his men. Major Ross said that he behaved very gallantly, but gave no particulars of his death. Willett reported that he was shot in the eye and instantly killed. A tradition which has been repeated by various writers ran to the effect that he was mortally wounded by an Oneida Indian and begged for quarter. The Indian retorted "Cherry Valley quarter," and immediately killed and scalped him. On this tale the stamp of fiction is evident. Benton, in his "History of Herkimer County," has recorded a more probable version. A dense fog hung over the stream when the Americans reached it, but as they attempted the ford, it drifted away and exposed them for a moment to the fire of the British covering party on the other bank, which killed several men and compelled the remainder to retire to the shelter of the woods. The fog again settled down, and several volleys were fired across the creek quite at random. When the rangers retired, they crossed unopposed and found Butler lying dead. He was recognized by an Indian, and Benton grimly adds that "the scalping part of the tragedy was probably performed in the best style of Indian execution."

Observing that his pursuers had the advantage of the ground and an opportunity of firing at a distance, Ross retired to the first favourable position, when he sent the sick and wounded to the rear and waited an hour for a renewal of the attack. The retreat was then continued with such rapidity that his men quite distanced the enemy, and marched, or rather ran thirty miles with scarcely a halt. A seven days' journey through a barren wilderness intersected by several streams, passable only on rafts, still lay before them, and they had lost or thrown away most of their blankets and packs, yet this was accomplished with little actual loss of life, though at the price of tremendous physical discomfort and suffering.

Walter Butler's activity and importance had been greatly exaggerated, and his death became the subject of general rejoicing among his enemies. Willett, of course, was not inclined to underrate his own services, and thinking that this event reflected great credit upon him, declared that in

four years Butler "had exhibited more instances of enterprise, had done more injury, and committed more murders than any man on the frontiers. Such was the terror in which he was held by the inhabitants of the frontiers, so cruel an enemy had he been to them that although Cornwallis's surrender took place about this time, yet the inhabitants expressed more joy at the death of Butler than at the capture of Cornwallis." Local traditions were long associated with his memory, and fifty years later the scene of his death was still known as Butler's ford. Still, with the single exception of the attack on Cherry Valley, he had had no share in the numerous incursions of the rangers. Caldwell, McDonnell, and others were much more active. But there was something in this man's personality that riveted the attention of friend and foe.

Haldimand, reporting his death to Lord George Germaine, spoke of him as "a very zealous, enterprising, and promising officer," and in another letter he expressed the hope that "Colonel Butler's good understanding, and the honourable cause in which his son fell, will console him in this heavy bereavement."

That he was not squeamish about bloodshed in fair fight is evident, but the other charges of cruelty laid against him appear to rest on the flimsiest of evidence. Quite recently he has been condemned for permitting himself to be employed in conjunction with the Indians at all. The same censure must rest upon Montcalm and Frontenac, on Sir William Johnson and Washington, on Brock and Drummond, and a host of others.

EARLY TRADERS AND TRADE ROUTES, 1760–1782.

(SECOND PAPER.)

BY CAPT. ERNEST CRUIKSHANK.

(Read 25th February, 1893.)

A most serious interruption to the fur trade during the revolutionary period, though fortunately of brief duration, was occasioned by the invasion of the Province of Quebec by the Americans in 1775-76. The merchants of Montreal attempted to guard against this by entering into a treaty with the invaders when they found that further resistance was useless. The third clause of the terms of capitulation, prepared on the 12th of September, 1775, by a committee of citizens, of which merchants of such eminence as James McGill and James Finlay were active members, reads thus :—

"That the trade in general, as well within the province as in the upper countries and parts beyond the sea, shall be carried on as freely as heretofore and passports shall be granted for that purpose."

To this, General Montgomery replied: "As far as it may consist with the safety of the troops and the public good, I shall be happy to promote commerce, and for that purpose to grant passports as heretofore."

General Wooster, who succeeded to the command of the army of occupation upon Montgomery's death, almost immediately withdrew the pledge so readily given by his predecessor.

"In January last," he informed a committee of Congress in a letter of the 5th of July, 1776, "I called the Indian traders of Montreal together and enquired of them whether they expected passports in the spring to carry their goods, etc., into the Indian country as usual; they told me they expected that indulgence, but at any rate they should be permitted to carry provisions to their people in the upper country. As I apprehended the granting of passports for the upper country might be attended with unhappy consequences to the interest of the united colonies, as goods they make use of for that trade were much wanted for our army, and there was the greatest reason to expect that by this way our enemies would be supplied with everything they wanted, I did not incline to grant passports without the direction of Congress. I therefore advised them to choose a committee to wait upon Congress for their

direction. They sent Mr. Frobisher, who did not return till the month of April. Soon after I was informed that the merchants were determined to send off their goods in the spring with or without passports, upon which I gave out a general order prohibiting the carrying of any coarse goods out of the city, except such as were needed by the country-people."

When forwarding the petition from the Montreal merchants, borne by Frobisher, General Schuyler prudently took care to represent the situation in such a light as to effectually destroy all its chances of success.

"Mr. Frobisher," he wrote to the president of Congress on the 20th of February, 1776, "delivered to me a letter, signed by himself and several others, containing the substances of the memorial he will present, and requested the mediation of my good offices with Congress. I am very apprehensive, sir, that if these people shall be permitted to go into the Indian country they might, if unfriendly to our cause, be very prejudicial to it, and the sending of such a quantity of provisions will strengthen the enemy at Detroit and Niagara, for by whatever route they go it will be seized by some one of the garrisons and appropriated to their own use. Mr. Frobisher's letter urges the danger of their traders starving if a supply of provisions was not sent up. That may be the case if they were to remain there another year; but the same letter observes that what is sent away in the month of May seldom arrives in the trading country before the winter sets in. If this be a fact, then they have now near a twelve months' provision, and by sending up two or three canoes express (navigated by persons we can depend upon), these traders may be brought away, and their provisions will suffice at least until they can reach Detroit, where they can be in no danger of starving."

The British merchants of Montreal had already given decisive evidence of their loyalty upon more than one occasion. It was in no respect lessened by the arbitrary rule of the invaders. Accordingly we find James Stanley Goddard, a very noted trader, accompanied by Richard Walker, secretly leaving the town in March, 1776, and taking an active part in assembling a body of Indians to open the communication with the upper posts, which defeated the Americans at the Cedars in May.

It was probably from the knowledge of their determined hostility, and in the hope of conciliating them, that the recently appointed commissioners of Congress in Canada, among whom Benjamin Franklin was the ruling spirit, were then induced to reverse Wooster's policy. Shortly after their arrival in the province they announced that they "had directed the opening of the Indian trade and the granting of passports to all who shall enter into certain engagements to do nothing in the upper country prejudicial to the continental interests."

In a few weeks, however, the problem was solved for them by the entire reconquest of the province by Sir Guy Carleton, and trade resumed its accustomed course.

The fort at Oswegatchie had never been a favourite resort for traders. In May, 1778, detachments from this post and Niagara took possession of Deer or Buck Island at the foot of Lake Ontario. Henceforth it became known as Carleton Island. Hamilton and Cartwright established a trading station there and others followed. The importance of Oswego had steadily waned for years, and in July, 1778, the last remaining trader was driven off by a raiding party from Fort Stanwix. This incident was described in a letter of the 2nd August of that year from Archibald Cunningham, factor at Carleton Island, to Francis Goring.

"L. Parlow was sent by our commandant with a party to bring off his family and effects from Oswego, but on his arrival found that his government had about fourteen days before been burnt by the rebels, who took most of his effects, even the handkerchief from his lady's neck, and his son prisoner, yet he had the good fortune to find they had missed his bag of piasters, two milch cows, his wife and two daughters, with which he made his retreat to this place."

In the autumn of 1778 a military post, which received the name of Fort Haldimand in honour of the governor, was constructed on the upper end of Carleton Island. It was provided with wharves and storehouses and was designed as an *entrepôt* for the supply of all posts on the lakes. Stores of all kinds were brought up in batteaux from Montreal and landed here until they could be reshipped in sailing vessels for Niagara. Its position rendered it tolerably secure from attack, and some of the armed ships on Lake Ontario were usually laid up here for the winter. A quantity of land was brought under cultivation for the supply of the garrison, fruit trees were planted and the place rapidly developed into a trading station of considerable importance.

Trading houses existed for some years, between 1770 and 1780, at Pinewood Creek and Piminiscotyan Landing on the north shore of Lake Ontario, and occasionally a stray trader wintered in the Missassauga villages at Rice Lake and Toronto. A man named Cowan is said to have permanently established himself at Matchedash Bay as early as 1778.

The great difficulties attending the transportation of supplies impelled General Haldimand to attempt the improvement of the navigation of the St. Lawrence by the construction of a series of short canals in the vicinity of Coteau. These works were carried out under the superintend-

ence of Captain Twiss and Lieut. Glenie, of the Royal Engineers, in 1780 and 1781.

Thirty years later, the latter officer referred with pride, in a letter to Lord Bathurst, to his share in the construction of the Coteau canal.

"At Coteau there is a violent rapid where formerly the loaded batteaux in going up the river were obliged to be unloaded and every article had to be carried across a neck of land composed of limestone. I cut a canal through it and erected a storehouse on one side. It was the first canal with locks ever made in Canada."

The volume of trade at Niagara rather increased than diminished in consequence of the war, although the quantity of furs brought in was much less than formerly. There are no statistics available of the amount of merchandise and peltry passing the portage around the falls, but it was undoubtedly large.

A letter from General Schuyler, dated in February 1776, contains the statement that "Mr. Francis Phister, a half-pay lieutenant in the Royal Americans who has bought an estate and resides in this county (Albany), has a contract to supply the carriages on the Niagara Carrying Place, by which, I have been informed, he clears between three and four hundred a year." At the same time Philip Stedman had acquired a monopoly of the right of transporting all goods over this portage.

The traders frequenting the country of the Six Nations took sides in the contest as their inclinations or interests dictated, the great majority however remaining faithful to their allegiance. We hear on the one hand of "Peter Lyckman, an Albany trader," acting as a spy for General Schuyler at Niagara and regularly sending him intelligence, and on the other, that "John Johnson, formerly an Oneida trader," was established by Colonel Butler as his resident agent among the Senecas near Canandaigua Lake, and that despite habits of dissipation he rendered important services.

The official correspondence of successive commandants of Fort Niagara with General Haldimand, and a stray bundle of letters from Francis Goring, furnish occasional glimpses of the mercantile activity of that post.

Colonel Bolton wrote on the 10th of November, 1777:—

"Governor Hamilton writes me that the merchants at Detroit have come to an agreement to build a wharf at Fort Schlosser, and a store at the water's edge 60 x 30, and also another of the same dimensions at the landing place."

December 14th, 1777.—"This place is quite lumbered with merchants' goods, which the badness of the season prevented Mr. Stedman from taking over the landing place."

April 7th, 1778.—"Mr. Pollard, on account of his bad state of health, intends quitting business as a merchant."

May 10th, 1778.—"I have always endeavoured to forward the merchants' goods by rotation, but they are frequently sent here without a single person to take care of them, and you cannot conceive what a plague and trouble I met with last year, every place in this fort was lumbered with their effects and the vessels obliged to navigate the lakes until the 30th of November."

May 12th, 1778.—"I have drawn a bill for £14,769 9s. 5d. in favour of Mr. Pollard for sundries furnished the savages, which Major Butler thought absolutely necessary, notwithstanding all the presents sent to this post last year."

Sept. 8th, 1778.—"Last winter this place was quite lumbered with merchandise; even the officers' barracks was filled with goods, as I would not allow any to remain at the landing during the winter, but ordered the soldiers of the garrison to bring down twenty-six batteau loads. Your Excellency very justly observes that the eagerness of the merchants in forwarding such immense quantities of merchandise may tempt the rebels to draw near this post, and I am astonished that last year, when there were goods to the amount of £50,000 on Deer Island, no attempt was made to destroy them; where they intend to lodge their goods this winter I know not, for it will be absolutely impossible to get half of them over this year on account of the provisions ordered for the upper posts."

Nov. 11th, 1778.—"Major Butler is building barracks on the opposite side of the river, and Captain Matthews is erecting a strong log-house to contain forty or fifty men at the upper landing."

R. Hamilton to F. Goring, 29th June, 1779.—"The general will allow no passes to any of the upper posts. He tells Mr. Matthews that when the commanding officer at Niagara writes for goods he will allow them to go forward."

Bolton to Haldimand, 6th July, 1779.—"The works are going on with all the expedition possible, considering the number of men here and the difficulties we have to encounter bringing home fire-wood, cutting logs, and batteauing provisions up to the landing, etc., at which place, as well as Fort Schlosser and Fort Erie, we have a great quantity of merchants' goods, owing to the large vessels being employed at Detroit this summer."

Goring to R. Hamilton, 14th September, 1779.—"Tobacco is a very scarce article at Detroit, and sells at from eight to ten shillings a pound. I have made out another Indian account for £5,808 17s. 9½d., which is now gone to the Indian country to be certified."

Bolton to Haldimand, 16th September, 1779.—"I have ordered the Haldimand to bring down 48 batteau loads of merchandise from the landing, and have sent orders to the officers at Fort Erie and Schlosser to hold themselves in readiness to join this garrison."

Memorandum on the fur trade, 1780.—"The least stop to sending goods into the Indian country may be prejudicial to the interests of those who trade there. The Indians are so long accustomed to the use of blankets, leggings, and other comforts that they are absolutely necessary to them. The advancement of trade will ever be the first object of attention; unhappily the traders do not consider the preservation of the country necessary to this end, but blindly grasp at all risks, the present means of making fortunes. If the goods they send into that country are disposed of, their sole purpose is accomplished. Under the pretext of the fur trade, an incredible number of persons since the beginning of the rebellion has been required, many more than before, though the Indians being employed in the war necessarily hunt less. The fur trade is not the object, it is the great consumption of rum and Indian presents, manifested by the enormous sums drawn for on those accounts by Government, purchased at a most exorbitant rate from traders."

Goring to Samuel Street, 15th March, 1780.—"Liquors are very scarce here and at Detroit. Lay in as large a stock as our circumstances will allow. Blankets are very scarce; Col. Johnson has sent down orders to buy up all the blankets in Canada. Be sure not to forget to bring something for the belly, as provision is very scarce here. If you could procure two or three cags of corned beef, I believe it will answer. We have experienced the longest and coldest winter ever known here. The river was frozen over from the 7th January to the 1st March, and passable for horses and sleds almost the whole time, which has put us back in our building, the snow being two and three feet deep in the woods; however, the weather has for this week past been milder, in which time we have got all the timber out and only wait for favourable weather to raft it home. Mr. Stedman has promised Col. Johnson all the boards he could cut. The spot is not fixed on as Col. Bolton has not dared to show his nose out this winter."

Bolton to Haldimand, September 14th, 1780.—"You have also, sir, a journal of the party I sent to Lake Huron by way of Toronto."

It is to be regretted that this journal has not been preserved either in the Haldimand collection or among the Colonial Office records.

"Return of batteau loads of merchandise ordered by merchants at Detroit for 1780—90 loads."

Col. Watson Powell to Haldimand, 25th May, 1781.—"The Detroit merchants having no cover for their goods at Fort Erie I desired the engineers to mark out ground for a storehouse there and have given leave to Mr. Garner who came from England last summer, to build one.

Walter Butler to Capt. R. Matthews, 2nd August, 1781.—"The rangers are made drudges of, for Mr. Stedman and others."

Col. H. Dundas to Major R. Matthews, 13th September, 1782.—"Mr. Thompson, a merchant here, has applied to me for leave to send a person to Toronto, opposite this, to trade with the Indians. I told him I could not grant his request until His Excellency's pleasure on that head was known. I must observe that Mr. Thompson is a very modest sort of man and has suffered much from the rebels on the Mohawk river."

Extract from the humble address of farmers residing on the west side of the river Niagara, 1783.—"We have no objection to furnish the garrison at a reasonable price what quantity they may want, fixed by the commanding officer, at the same time we beg leave to sell to the merchants and others at the price we can agree on from being obliged to pay merchants their own price for everything we want."

Haldimand's letters show that he kept a watchful eye upon the conduct of the traders everywhere, and that he was always anxious to promote the true interests of commerce.

In April, 1781, he wrote Capt. Sinclair, lieutenant-governor of Mackinac. —"The season for the departure of the trading canoes bound up the Grand River being arrived, and the traders very solicitous for their passes, I am obliged to gratify their wishes, although I should have been glad to have heard from the Indian countries before they set out, which the backwardness of the season has prevented. I have, however, taken the necessary precaution of laying on them the strictest injunctions of submitting implicitly to such restrictions as from circumstances unknown here and the good of his majesty's service you may see fit to lay them under, and I must earnestly desire that you will pay the utmost attention to the respective destinations of these traders who, I cannot help thinking, under a pretext of exercising the fur trade, abuse the indulgences granted them for that purpose, and do many things injurious to the king's interest and likewise to the reputation of the trade. I am not so well

informed of the complicated circumstances attending that remote trade as I could wish, or as it is necessary I should be. I enclose to you a few hints and memorandums upon that subject, and I request you will with your leisure correct them and suggest to me all such as your long experience and knowledge of that country, and your late observations may have furnished you with, that I may be the better enabled to give that encouragement I wish to so essential a branch of trade, but at the same time carefully avoid giving latitudes, which in the present state of affairs might tend to prejudice what we most want to preserve. So heavily do the traders complain of the losses they have sustained that to content them I have given passes for 100 canoes upon the conditions I have already mentioned to you, that whenever you see the least prospect of danger you will not suffer a single article to be sent."

Again, on the 31st of May, he said: "The Pottowatamies and all other Indians at trading posts may be informed that if they ever again permit the enemy to pillage the traders they may rest assured that a trader will never be permitted to return to them—they being on their hunt or any other evasive argument will not be any more admitted as an excuse. If traders are sent amongst them at their request, it is their duty to protect them, and they must never leave their villages defenceless. If they keep out proper scouts and support that intercourse with each other which the times require, they can never be surprised. Much credit should be given to the Indians towards the Mississippi, who have so faithfully protected their traders."

In August, 1782, the reckless misconduct of some traders caused the adoption of more stringent regulations than ever before.

"As the traders will not conform to regulations established for the last year, recommended by his excellency the governor-general, although their passes oblige them to conform to such regulations, it is not judged necessary to stop trade on account of the obstinacy and demerit of the trader; therefore another scheme is proposed to them to avoid the ruin of the most worthy. Goods will be permitted to go to a certain number of wintering grounds. Proper people will be chosen by the lieutenant-governor for these places. The others must lodge their goods in the fort under a proper person also chosen by the lieutenant-governor, and they will be permitted to take an equal quantity out weekly, giving bond that they will sell none but by retail at the post."

During the same summer a commission composed of Lieut.-Col. Henry Hope, Sir John Johnson, and James Stanley Goddard, was sent to Mackinac to inquire among other things into the condition

of the Indian trade and the state of the military posts on the lakes. They left Montreal on the 21st of August and arrived at their destination on the 15th of September, having been delayed for three days by high winds on Lake Huron. Their course was described by Hope in these terms:—"Up the Grand River (Ottawa) from Canesadago to Matouan (where we quitted it), 117 leagues with 16 portages; up the Little River to the entrance of Lake Nipissing, 18 leagues with 15 portages; across that lake 12 leagues; down the French River, 25 leagues with 3 carrying places, and across Lake Huron to the Island of Machilimakinac 79 leagues; the whole making 251 leagues with 34 carrying places, after which, when I observe to your excellency that the shallowness of the water and rapidity of the current in these rivers are such as to render it absolutely impossible to navigate them in any other craft but bark canoes, it is of course unnecessary almost to add that this communication can serve no other military purpose than to forward expresses to the upper country, or perhaps to throw a very small reinforcement of men into either of the posts of Machilimakinac or Detroit upon emergency, in case of any part of the other by the lakes being intercepted for a time."

He returned by way of Niagara and examined the conditions, terms, and mode of transport across that important carrying place. "On the 11th of October arrived at Carleton Island. I embarked in a batteau next morning and after visiting the post of Oswegatchie and seeing those very ingenious and useful cuts and canals that have been made to facilitate the navigation up these amazing rapids at Coteau du Lac and some other adjacent spots, the current brought me down to Montreal in something more than 48 hours, though a distance of near seventy leagues, and which to ascend with loaded batteaux even in the longest days of the summer season seldom takes less, I am given to understand, than fourteen days and at this time of the year nearer twenty."

The only trader who published a record of his experiences in the country to the north of Lake Superior during this period, that has come to my notice, was J. Long, whose travels appeared in 1791.

After serving seven years as an articled clerk to a Montreal merchant, Long entered the Indian department as an interpreter. In 1777 he left his employment and became a trader in the service of a northwest fur company at a salary of £150 per annum. Leaving Montreal on the 4th of May with two *canoes de maitre*, each manned by ten Canadians, he arrived at Mackinac on the 17th of June. He then proceeded to Sault Ste. Marie and on the 4th of July reached Pays Plat, where his goods were unpacked and made into smaller bales, as it was estimated there were a hundred and eighty carrying places to cross before arriving at

the place where he intended to winter. Twenty Indians were then hired to assist them in passing La Grand Cote de la Roche, the steep and difficult portage at the mouth of the Nipigon. The journey to Lake Alempigon or Nipigon was accomplished with ease. On the first of August he began his march for Sturgeon Lake, accompanied by fifteen Indians, and on the 25th of September arrived at Lac La Mort (Dead Lake), where he proposed to remain during the winter. In January, 1778, he ran short of provisions and was obliged to remove to Lake Manantoye, where Mr. Shaw, a brother trader, was wintering. The severity of the season was so great that James Clark, a trader in the employ of the same company, had five of his men starved to death at Lake Savan. Between Red Lake and Salt Lake, Long states that there were "fourteen portages and twenty-two creeks." From the latter to Cariboo Lake it was eight days' march and there were five creeks and three portages to cross. At this lake a French trader had been settled some years before, but Long found it deserted. The Indians estimated the distance to Lake Schabeechevan (Weed Lake) at ten days march across thirteen portages and the same number of creeks. The trail to Lake Arbitibis passed through three small lakes, and over five portages and eight creeks, and thence to Crow's Nest Lake was a short journey. In April, Long received a letter from one Jacques Sameron, a trader in charge of a party in the service of his employers that had wintered at Lake Schabeechevan, informing him that he intended "to make a *grand coup*," by selling his packs to the Hudson Bay Company and embezzling the proceeds. In the hope of preventing this act of dishonesty, Long made a forced march to Sameron's station only to find on his arrival that the delinquent was several days' march on his way to Hudson Bay. On the 23rd of May he finally abandoned his station at Lac La Mort and returned to Pays Plat with 140 packs of furs.

Remaining there only five days to deliver his furs and receive supplies Long set out on his second expedition, proceeding by the river La Pique, Portage La Rame Nipigon River, Great Crow's Nest Lake and Skunk Lake to Lake Schabeechevan, where he built a house. During the same winter Mr. Fulton established a post at Shekarkestergoan. Joseph La Forme, who led a party to Lac Le Sel, was killed by an Indian, and Long took his men into his own service. In February, 1779, he was visited by a Hudson Bay Company's agent from Fort Albany, which is described as "thirty days' march distant from his station at Lake Schabeechevan, over ninteen portages and creeks, and fourteen rapids." In the spring, Long returned to Mackinac, where he became the adjutant of a militia company formed by the fur traders for the defence of that place.

In that capacity he accompanied the expedition to Prairie du Chien next year.

The formation of the Northwest Fur Company in 1783, marks the beginning of a new era in the Canadian fur trade. The number of "adventurers" engaged in the Northwest trade had by this time been reduced by keen competition, mismanagement, or ill-success to twelve. Among these, the brothers Benjamin and Joseph Frobisher were particularly distinguished by their activity and energy. When the treaty of peace was published and it became probable that the Grand Portage would be found to lie within the United States, they at once began explorations for a new route within British territory, in which they succeeded beyond their expectations. They next took an active part in the organization of a company to include all the traders still concerned in that business. "Being convinced by long experience of the advantages that would arise from a general connection not only calculated to secure and promote their mutual interests but also to guard against any encroachments of the United States on the line of boundary as ceded to them by treaty from Lake Superior to Lake du Bois, they entered upon and concluded articles of agreement under the title of the North-west Company, of which we were named directors, dividing it into sixteen shares, of which each proprietor holds a certain number proportionate to the interest he then had in the country."

With this event the first period of the history of the fur trade naturally terminates.

NAVIGATION OF THE GREAT LAKES—1760-1782

Much of the commerce on the lakes continued to be carried on in batteaux or large canoes, although these were being gradually superseded by sailing vessels. The attendant perils of this kind of navigation were not restricted to the danger of shipwreck and drowning. The Annual Register for 1770 records this ghastly tale.

"Letters from Detroit by Monday's New York mail inform us that several boats with goods had been seventy days in crossing Lake Erie, in which time the distress of the people was so great that they had been obliged to keep two human bodies which they found unburied on the shore, in order to collect and kill the ravens and eagles which came to feed on them, for their subsistence. Many other boats have been frozen up within forty miles of Detroit and several traders' small boats with goods had been lost."

On Lake Ontario, even at that date, much of the transportation was done in the "king's ships."

Under date of the 29th of May, 1767, the Register notes, with evident satisfaction, the growth of shipping on that lake.

"There are now four brigs from forty to seventy tons, and sixteen armed deck-cutters on Lake Ontario; by this means the navigation of the great lakes and a mart of trade will soon be established equal to that of the Caspian Sea."

An official return of the 30th of July, 1778, gives a list of all vessels built on the lakes since the year 1759.

ON LAKE ONTARIO.

Scow Mohawk, of 16 guns, built at Niagara in 1759 and 1760, cast away in 1764.

Ship Onedago, of 18 guns, built at Oswego in 1760, cast away in 1764.

Sloop Missassago, of 8 guns, built at Oswego in 1760, cast away in 1765.

Schooner Mercury, of 6 guns, built at Oswego in 1760, laid up and decayed.

Scow Johnston, of 12 guns, built at Oswegatchie, taken from the French in 1760, cast away in 1764.

Schooner ——, of 12 guns, built at Oswegatchie, taken in 1760, cast away in 1761.

Schooner ——, of 6 guns, built at Oswegatchie, taken in 1760, cast away in 1761.

Schooner Brunswick, of 10 guns, built at Oswego in 1765, in service till decayed.

Scow Haldimand, of 18 guns, built at Oswegatchie in 1771, still in service.

Scow Seneca, of 18 guns, built at Oswegatchie in 1777, still in service.

Sloop Charity, of six swivels, built at Niagara in 1770, cast away in 1777.

Sloop Caldwell, of two guns, built at Niagara in 1774, still in service.

ON LAKE ERIE.

Sloop ——, of 8 guns, built at Navy Island in 1763, cast away in 1764.

Schooner Victory, of 6 guns, built at Navy Island in 1763, laid up and burned by accident.

Schooner Boston, of 8 guns, built at Navy Island in 1764, laid up and burned by accident.

Schooner Gladwin, of 8 guns, built at Navy Island in 1764, in service till decayed.

Sloop Charlotte, of 10 guns, built at Navy Island in 1764, in service till decayed.

Schooner Gage, of 16 guns, built at Detroit in 1773, still in service.

Schooner Dunmore, of 12 guns, built at Detroit in 1773, still in service.

Schooner Hope, of 4 swivels, built at Detroit in 1771, still in service.

Sloop Angelica, of 4 swivels, built at Detroit in 1771, still in service.

Sloop Chippawa, of 4 swivels, built at Pine River in 1769, cast away in 1775.

Schooner Faith, of 4 swivels, built at Detroit in 1774, still in service.

Sloop Felicity, built at Detroit in 1775, still in service.

Sloop Adventure, of 4 swivels, built at Detroit in 1776, still in service.

Sloop Wyandot, on the stocks.

Paquet, on the stocks.

Scow Ottawa, on the stocks.

On Lake Huron.

Sloop Welcome, built at Machilimakinac in 1777, still in service.

On Lake Michigan.

Sloop Archangel, built at Detroit in 1774, still in service.

The manner in which these vessels were employed was described by Col. Bolton in a report of the 10th of May, 1778.

"The scow Haldimand, the scow Seneca, the sloop Caldwell and one more of the same burthen very useful for Lake Ontario. The schooner Gage, the Ottawa (when built) for Lake Erie. The schooner Hope, the schooner Faith, from Fort Schlosser to Fort Erie. The schooner Dunmore for Lake Huron. The sloop Felicity not wanted in the service. The sloop Angelica not worthy of repairs. The sloop Welcome, the property of Mr. John Askin. The sloop Archangel, the property of Messrs. Barth & Son, Lake Michigan, useful by report of Major De Peyster. The Wyandot, packet, burthen 30 tons, when launched to be employed from Detroit to Fort Erie."

A memorandum from Capt. Andrews of the same date requested permission "to enlarge Niagara Navy Hall wharf, there being too little water at the present wharf to careen large vessels at, and it being too small for three vessels to winter at; to build a vessel at Niagara in lieu of the Haldimand, informed that she cannot last above another year, therefore no time should be lost to provide timber; and to erect barracks at Navy Hall for the seamen, a rigging and a sail loft absolutely necessary to fix rigging and make sails in the winter."

The vessel built to replace the Haldimand was the ill-fated schooner Ontario, which foundered with all on board on her first, voyage in October, 1780.

Of this vessel Glenie remarks, "I told Capt. Shank when he was building the Ontario that he was making her too flat-bottomed and that she would overset. Accordingly she overset a few leagues from Niagara, and Col. Bolton and 132 others perished in her."

From another return of the 1st of December, 1782, I extract the following statement of ships then on the lakes.

ON LAKE ONTARIO.

Haldimand, 150 tons, 14 guns, 35 men.

Seneca, 130 tons, 18 guns, 35 men.

Mohawk, 50 tons, 5 guns, 14 men.

Caldwell, 37 tons, 2 guns, 14 men.

Limnade, 220 tons, 16 guns, 45 men.

Four scows.

ON LAKE ERIE.

Gage, 114 tons, 12 guns, 30 men.

Dunmore, 70 tons, 10 guns, 25 men.

Hope, 70 tons, 6 guns, 18 men.

Wyandot, 37 tons, 10 men.

Faith, 37 tons, 10 men.

Angelica, 59 tons, 12 men.

Felicity, 45 tons, 12 men.

Adventure, 18 tons, 8 men.

Welcome, 136 tons, 35 men.

The new vessel Rebecca, 136 tons, 35 men.

A new vessel built at Mackinac.

During this period, and in fact for a full half century, from 1763 until his death at a very advanced age in 1812, the senior officer on Lake Erie was Captain Alexander Grant. According to the authoress of "Letters from the Mountains," he was a younger brother of the house of Glenmoriston in Inverness-shire. In 1792, Grant was appointed a member of the Executive Council of Upper Canada, on which he continued to serve to the end of his life. As president of that body in 1805, he became administrator of the government of the province upon the death of General Hunter.

NOTE ON A MEMORABLE EPOCH IN CANADIAN HISTORY.

BY SANDFORD FLEMING, LL.D., C.M.G., ETC.

(Read 11th February, 1893.)

On the 22nd of July, 1793, a traveller from Montreal reached the shores of what is now the western province of Canada. This traveller was the first civilized man who had traversed the continent between the Atlantic and Pacific oceans in any latitude. In a few months a century will have elapsed since he first looked upon the waters of the Pacific.

On the 20th of July, 1871, seventy-eight years after the consummation of the first transcontinental journey, British Columbia, only a few years emerged from the wilderness, was included in the Canadian Confederation. On that day Canada attained magnificent geographical proportions; the Dominion extended across the entire width of the northern continent. There are not many of our people who are capable of grasping the immensity of this extent or who are impressed with the full value and importance which this acquisition confers on our country. Even the best informed amongst us who contemplate the vast breadth of our possessions can form but imperfect theories of the immeasurable natural wealth it contains, and there are few who would venture to assign a limit to the national prosperity which in the future we may enjoy.

No single division of the British Empire wherever situated, in the Indian seas, in the south of Africa, or in the Australian antipodes, can compare with the Dominion in geographical extent. Of all countries owing allegiance to Queen Victoria no single land can more truly claim the appellation "Greater Britain."

The eve of the completion of a century since the greatest triumph of the famous traveller, Sir Alexander Mackenzie, suggests that we may recall his life and labours, and consider the results which have sprung from his remarkable discoveries or which have been influenced by them.

In 1789 Sir Alexander Mackenzie, then about thirty years of age, discovered the great river which bears his name, and descended its waters to the Arctic Ocean. He thus established the important truth that the northern part of this continent extends unbroken to the Arctic circle. Three years later he undertook his more famous expedition with the

design of penetrating the Rocky Mountains and pursuing his journey in a westerly direction until he found the Pacific. By the discoveries which Mackenzie effected on these expeditions new realms were brought within the influence of the Empire, and the great fact became established that the shores of the vast territory, now the Canadian Dominion, are buffeted by the billows of three oceans—the Atlantic, the Pacific and the Arctic.

The world is familiar with the story of the persevering and heroic efforts to find a north-west passage. We all know that many lives and an enormous amount of treasure have been sacrificed in fruitless attempts to discover a navigable channel in the northern hemisphere, from Europe to Asia. It is not so well remembered, however, that three centuries back the "North-West Passage" was alleged to have been found. I allude to the claim advanced by Juan de Fuca, that he had discovered open water through the continent and that a ship could pass in a given number of days from one ocean to the other. He set forth the character of the discovery claimed by him and described it as extending from the Pacific coast in the latitude of British Columbia on the west to Hudson Strait on the east, and that it was an open waterway generally direct in its course, with a width ranging from 30 to 40 leagues and upwards.

Belief in the alleged discovery among cartographers appears to have been universally entertained. De Fuca promulgated the statement in 1592, and maps published by the French and English Royal geographers in 1752 and 1768 show the defined passage I have described. The whole turned out to be a pure fiction. The first consequence of Mackenzie's travels was to prove irrefragably the non-existence of De Fuca's channel and to sweep away all belief concerning it. The only trace left of the geographical fraud is the name which is still retained by the inlet extending between Vancouver Island and Washington Territory, leading from the Pacific to the Gulf of Georgia. We are unable at the present day to estimate the great influence exercised on geographical science by this disclosure. The facts brought to light by the discoveries of Mackenzie distinctly established beyond all question that the shores of the continent on the Pacific side continue northward until they terminate within the Arctic circle.

An account of Mackenzie's travels was published in 1801. We possess in this volume a detailed narrative of his voyage from Montreal through the continent in 1789, 1793 and intervening years. The maps which accompany the volume present the true position of the lakes and rivers which he discovered; they likewise show the route he followed through

the mountains of British Columbia to the sea. These publications, the record of years of labour, set at rest the pretensions of De Fuca and demonstrate the absolute impossibility of any practicable passage for ships between the Atlantic and the Pacific through the northern continent; to attain which passage so many futile attempts have been made, and which have occupied so long and so fruitlessly the attention of governments and called forth the enterprising spirit of so many navigators.

On his second voyage, commenced early in 1792, Mackenzie left Montreal and penetrated to Fort Chipewyan on Lake Athabasca, reaching the latter in October the same year. He had started with the design of finding a way through the Rocky Mountain range to the western coast. Whatever difficulties might present themselves he had resolved if at all possible to reach the Pacific Ocean. Without more delay than was necessary in preparing for the journey to the westward, he left Fort Chipewyan and proceeded up Peace River until his progress was impeded by ice. He was then forced to remain winter-bound until the following spring.

On May 9th, 1793, when the river opened, the voyage was resumed. The expedition followed the Peace River to the Forks; one branch is named the Finlay, the other the Parsnip, the latter of which he traced nearly to its source. Arrived at this point, Mackenzie abandoned these waters and proceeded overland, cutting a passage through the woods so that he could carry the canoe. He continued by the trail formed until he reached a stream, the waters of which were flowing in the opposite direction to the current he had left on the eastern slope. This led to a great river called by the Indians of the locality Tacoutche; it is now known as the river Fraser; Mackenzie formed the opinion that it was the upper waters or a branch of the Columbia which river is known to discharge into the Pacific in about latitude forty-six. This was the common belief until 1808, when Simon Fraser descended the Tacoutche to the Gulf of Georgia, proving it to be an entirely independent stream, a discovery held to be so important that the name of Fraser was given to the river and which by common consent it still retains in honour of the man who first followed it to its mouth.

Mackenzie embarked in his canoe, floated down the Tacoutche five days; the party met Indian tribes, with some of whom difficulty was experienced. He learned from the Indians that the river they were descending was of great length and its navigation attended with many perils; his men became discouraged and mutinous; under the circumstances in which he was drifting he determined to abandon the attempt

to descend to the mouth of the supposed Columbia, and resolved to make the effort to reach the sea by a land route. In order to find the Indian trail which he learned would conduct him to the Pacific, the explorer had to turn back and ascend the Tacoutche for some distance. Although depressed at what he held to be a misfortune, this change of route led to the accomplishment of his purpose and enabled him to reach the sea in the space of sixteen days after leaving the main river. Mackenzie again had adventures with the different Indian tribes; he and his men underwent much hardship, and from the state of their provisions were placed on short allowance. The traveller, however, finally attained his long cherished purpose, he reached the shores of the Pacific overland from the Atlantic by a journey through the northern continent of such extent that it must be counted by degrees of longitude. The whole country he traversed is now embraced within the Dominion of Canada.

Every page of Mackenzie's journal shows that his explorations were not effected without constant toil and privation. The discouragements arising from the difficulties and dangers he experienced, and they were incessant, had no influence on his cool determination and dauntless spirit. The many tedious and weary days of physical labour and mental strain, the gloomy and inclement nights to which he was constantly exposed, were not, however, passed in vain; he gained his great reward in the knowledge that he had in the interest of his country attained the object of his long premeditated design; he had penetrated a vast continent for the most part in a condition of wild nature; he had overcome the obstacles imposed by rapid rivers previously unknown, by rugged mountain ranges, by distance, by intervening forests and by extremes of a variable climate. From time to time obstacles presented themselves in the enmity of hostile native tribes, who had never before looked upon the face of a white man, but on the day he arrived at the Pacific coast he had the unqualified satisfaction of feeling that his undertaking had been crowned with complete success. His discoveries settled the dubious point of a practicable north-west passage through the temperate zone; he set at rest forever this long agitated question with the disputes which had arisen regarding it; he added new regions to the realm of British commerce, and in doing so extended the boundaries of geographical science. He did much more, although the full effect of all he had accomplished was unknown to him, we can now, however, attribute to the enterprises to which Mackenzie's discoveries led, that the territory west of the Rocky Mountains became a British province; indeed it is problematical whether in the absence of his discoveries any portion of that country would at present constitute part of the Dominion of Canada.

Many, I think, will agree with me that among the men who have distinguished themselves in the annals of our country there is no name more illustrious than that of Sir Alexander Mackenzie. In my judgment there is no event which we can point to with greater interest and satisfaction than the completion of his perilous enterprise on that day, July 22nd, 1793, when, with his Canadian comrades, he floated in a small canoe on the tide-water of the Pacific.

THE PRESENT ASPECT OF THE OSSIANIC CONTROVERSY.

BY REV. NEIL MACNISH, B.D., LL.D.

(Read April 1st, 1893.)

James MacPherson was the translator of the poems of Ossian. He might with all fairness have applied the well-known words of Horace to himself, *Exegi monumentum aere perennius:* so wonderful and far-extending was the impression which the poems of Ossian in their English dress speedily made in the literary world, and so firm is the position which, after the lapse of more than a hundred years, those poems occupy in the literary annals of mankind. Professor Blackie thus writes: "On the 2nd day of October, 1759, Dr. Carlyle, of Inveresk, came from the neighbourhood of Dumfries to Moffat and found there John Home, the author of "Douglas," with whom he took up his quarters for the day. In the course of conversation, Home mentioned to Carlyle that he had long been on the scent for some old Gaelic poems which Professor Ferguson, an Atholl man, informed him were current in the Highlands, and that he had at last stumbled upon a person who could give him some definite information on the subject. This was a young man, by name James MacPherson, from the district of Badenoch, in the centre of the Highlands, of good family and well educated, an excellent classical scholar and no stranger to the Muses, and who was at that time acting as tutor to young Graham of Balnagown, afterwards Lord Lynedoch. From this young man Home had learned, that he had in his own possession some of those old poems, which Home eagerly solicited him to translate." MacPherson produced, after much solicitation, an English version of the "Death of Oscar," *Bas Oscair.* The poetical genius which that poem, even in its English dress, displayed, gave immense pleasure to Home and to Dr. Blair, who was then in the zenith of his literary fame. A small volume was subsequently published by MacPherson with the designation, "Fragments of Ancient Poetry collected in the Highlands of Scotland." The public interest in Gaelic poetry at once became deeper and wider, insomuch that the prominent patrons of literature in Scotland, Lord Elibank, Dr. Robertson, Mr. John Home, Sir Adam Ferguson, Dr. Blair and others, determined to send James MacPherson on what they termed a poetical mission throughout the Highlands, for the purpose of collecting all the Ossianic poetry that could be procured, and thus of rescuing from oblivion

poems which could not be otherwise than valuable and entertaining in an eminent degree. MacPherson, accordingly, entered on his labours in 1760 under the most favourable auspices. Wherever he went, in the prosecution of his laudable mission, he received kindly recognition and ready assistance. So successful were his efforts, and so indefatigable was his diligence, that in 1762 he published in one volume his translation of Fingal and sixteen other poems; and that in 1763 he published another volume containing Temora and five other poems. As Dr. Clerk remarks, "The publication of these poems excited the wonder of literary men throughout Europe. They were translated into French, German, and Italian, and speedily ran through various editions. They commanded the admiration of Napoleon, of Goethe, who in his 'Werther' gives 'the Songs of Selma,' and of Schiller, who speaks of the 'great nature of Ossian.'" The Abbé Cesarotti, a professor in the University of Padua, who translated the poems of Ossian into Italian, thus lucidly sets forth the general impression which those poems made. "The appearance of the poems of Ossian was a phenomenon so unexpected and extraordinary, that it is not surprising they should have excited, during even a period of enthusiasm, doubt and astonishment. In a country scarcely known to history, mountainous, difficult of access and almost constantly shaded with mists; in a state of society the most unpolished, wretched and barbarous, without trade, without learning, without arts and sciences, how could such a transcendent genius arise who may be said to dispute the palm with the most celebrated poets of the most civilized nations, and with those even who for so many ages have been considered models of art? This novelty was too much at variance with the generally received opinion, to be implicitly believed without controversy. Was there truly an Ossian? Was he really the author of the poems which have been published under his name? Can this be a spurious work? But when? How? By whom? Those are questions which for a length of time have agitated and divided public opinion in England, while Europe regarded with veneration this surprising phenomenon." Davies, the famous Welsh scholar, after examining the *Claims of Ossian* with critical severity, was led thus to write: "These poems do credit to Caledonia. The Gaelic originals constitute a splendid monument of its language. The Fingal and Temora, upon subjects so interwoven with the feelings of the people, set this corner of the island far above poetic competition, not only with any Celtic tribe, but we may almost say with any nation in Europe."*

There were not wanting those who maintained, that it was impossible

* The Claims of Ossian, p. 326.

for poems such as those that had been ascribed to Ossian, to be handed down during many centuries, mainly by oral tradition. Johnson and Hume and Laing were conspicuous among those who opposed the unambiguous asseverations of MacPherson regarding the poems of Ossian and the manner in which he came to obtain possession of them. Those influential writers went the length of imputing very unworthy motives to MacPherson, and of casting severe aspersions on his literary honesty. In writing to Dr. Blair, Hume makes use of this caustic language: "You need expect no assistance from MacPherson, who flew into a passion when I told him of the letter I had written to you; but you must not mind so strange and heteroclite a mortal, than whom I have scarce ever known a man more perverse and unamiable. He will probably depart for Florida with Governor Johnstone, and I would advise him to travel among the Chickisaws or Cherokees in order to tame him and civilize him." There are not wanting witnesses to attest that the names of Fingal and his heroes were known long before MacPherson published his translation of Ossian. Barbour in his "Bruce," which was published from a MS. that bore the date 1491, makes a distinct reference to Fingal and Goll MacMorni—Gol MakMorn, one of his greatest heroes. In his Gaelic edition of the Psalms of David, which was published in 1684, Kirke makes special mention of Fingal in the author's address to his book. Bishop Carswell of Argyll published in 1567 his Gaelic version of John Knox's Liturgy—the first book that was ever printed in Gaelic In the preface, mention is made of those who are desirous of composing histories concerning warriors and champions, and Fingal the son of Cumhall, with his heroes. Dunbar mentions Fyn MaKowll and Gow MacMorn, *i.e.*, Fionn MacCaomhail and Goll MacMorni. The poems contained in the Dean of Lismore's book were collected by James MacGregor, Dean of Lismore, who died about the year 1551. The book in question is, therefore, more than three hundred years old, and a great portion of it may be assigned to as early a date as 1512. It contains twenty-eight Ossianic poems, extending to two thousand five-hundred lines. It thus appears that, apart from the evidence which MacPherson was able to adduce, other writers of a much earlier date place the existence of poems belonging to the age of Ossian beyond a doubt.

It must be difficult for us, with all our modern appliances, to form a correct estimate of the retentiveness, which, under particular cultivation, the human memory is capable of acquiring. We learn, on the authority of Caesar, that the Druids of Britain were in the habit of committing to memory a great number of verses, insomuch that some Druids expended twenty years in completing their education. "They seem," he writes, "to have instituted this method for two reasons: because they would

not have their learning divulged to the vulgar, and lest those who learned by depending on their writings would be less assiduous in cultivating their memory, and because it frequently happens that by the assistance of letters persons take less pains in getting by heart or remembering." Grote informs us that there were educated gentlemen at Athens, who could repeat the Iliad and Odyssey by heart. In the preface to MacCallums' Ossian these very judicious remarks are made: "That until the present century almost every great family in the Highlands had its bard, to whose office it belonged to be master of all the poems of reputation in the country; that among these poems the works of Ossian are easily distinguished from those of later bards by several peculiarities in the style and manner; that Ossian has always been reputed the Homer of the Highlands, and all his compositions held in singular esteem and veneration; and that it was wont to be the great entertainment of the Highlanders to pass the winter evenings in discoursings of the times of Fingal and rehearsing these old poems, of which they had all along been enthusiastically fond." Than Dr. John Smith, the author of the Sean Dana, no one is entitled to greater respect in connection with the Ossianic controversy. He was born in the classical portion of the Highlands of Scotland, and his devotion to Gaelic and Gaelic literature was great and successful. He thus writes: "That there have been in the Highlands of Scotland for some time back a good many poems that were ascribed to Ossian, and repeated by almost all persons and on all occasions, is a fact so indisputable that nobody can be hardy enough to deny it. There is not an old man in the Highlands but will declare, that he heard such poems repeated by his father and grandfather as pieces of the most remote antiquity, long before the translation of them had been thought of. Bards who are themselves several centuries old quote them, imitate them and allude to them. Just now in the parish of Kilninver is a tradesman and poet of the name of MacPhael, whom I have heard for weeks together repeat ancient tales and poems—many of them Ossian's—from five to ten o'clock in the winter nights. In Glendonan, Kilchrenan Parish, is a family of the name of MacDugal; and at Arivean, Glenorchay Parish, another of the name of MacNicol, now almost extinct, both of whom were such senachies for some generations back, that they could entertain at this rate for a whole winter's season. What wonder if the poems of Ossian, where such was the custom, have been so long preserved." Those in our day who are disposed to call the authenticity of the poems of Ossian in question, must find very much to modify their opinion in the citations which I have made—citations which could easily be multiplied, in favour of the extensive prevalence of Ossianic poetry in the Highlands of Scotland during

the last century, and of the consequent facility that MacPherson must have experienced in collecting these poems, which, after he had collated and arranged them, he gave to the world as the poems of Ossian. Dr. Smith had abundant reason on his side when he thus wrote: "Within a century back, the Highlands of Scotland have undergone a greater revolution than for ten centuries before that period." With still greater reason, may we affirm that during the hundred and thirteen years that have elapsed since Dr. Smith published his Gaelic Antiquities, the Highlands of Scotland have undergone a great transformation by extensive emigration from many a strath and glen, so that comparatively imperfect facilities now remain for determining the manner in which Ossianic poems were respected, and preserved, and recited in the past. In a paper which Dr. MacNeill, the author of the Literature of the Highlands, read before the London Gaelic Society a few months ago, he asserts, that shortly after Dr. Clerk's edition of Ossian was published, Campbell, the author of Leabhar na Feinne and of the Popular Tales of the West Highlands, reviewed the work in question so ruthlessly and successfully that all the scaffolding of the authenticity, elaborately erected by Dr. Clerk and others, was laid in ruins. Dr. MacNeill further asserts, that MacPherson's Epics are the clever work of an exceedingly able but irascible Highland genius of the central land of the Gael, by whom they were composed and translated about one hundred and thirty years ago. He contends, without adducing sufficient evidence in favour of his averment, that the prominent Gaelic scholars of our day entertain a similar opinion concerning the poems of Ossian. So patriotic was the spirit which animated Mr. J. F. Campbell, and so enthusiastic was he in connection with the folk-lore and ancient poetry of the Highlands of Scotland, that his memory deserves to be kindly perpetuated. On one side of the monument which the Islay Association, with praiseworthy affection and liberality, erected to commemorate his many excellent qualities, these Gaelic words occur:

Iain og ile
Fior Ghaidheal, sar dhuin' uasal agus ard sgoileir
A choisinn urram agus clu anns gach cearn.
Ged nach do shealbhaich e oighreached aithrichean,
Shealbhaich e gradh nan Ileach,
Agus
Bithidh a chuimhne buan-mhaireann am measg
Chlanna nau Gaidheal.

He was the implacable opponent of MacPherson and Dr. Smith, and his excellent brother Donald Smith. He says "that MacPherson undoubtedly tried to deceive. The two brothers, John and Donald Smith, were

no deceivers, but their ideas as to authenticity differed from modern ideas on that subject." It is apparent, therefore, that Campbell made strong insinuations against the honesty and veracity of MacPherson and John and Donald Smith. A new edition of his Popular Tales of West Highlands was issued during last year. Were a critical examination made of his statements regarding the Ossianic controversy, it would be easy to show, that his views are at times contradictory, and that he could not have had a consistent theory to advance regarding the poems of Ossian. It was to himself that, so late as 1861, trustworthy correspondents sent such information as this from Bembecula and Skye: "A great variety of other poems that go under the name of Ossian's poems are commonly recited by the people. I have frequently questioned old men concerning the Fingalians in almost all parts of the Highlands, from Cape Wrath to the Mull of Cantyre. All had heard of them, and all firmly believed in their existence. Donald Stewart, Skye, 92 years of age, often heard the poems of Ossian. Every person knew them, most could recite them, and all admired them. Another old man had as much Ossianic poetry as would take him whole days in the recital, yet he could recite for whole nights together without the slightest hesitation. A certain schoolmaster affirmed that his father had more Ossianic poetry than all ever MacPherson translated, and that he himself when a boy could repeat what would form a tolerably sized volume. He was personally acquainted with many old men who could repeat lots of Ossianic poetry." Those citations, and citations of a similar kind, which could be made from Campbell's Popular Tales of West Highlands, are of themselves extremely valuable, because they allow us to understand that after the lapse of an entire century since MacPherson went on his poetical mission through the Highlands, Ossianic poetry still survived in the Western Isles, and among Gaels who never heard of MacPherson and who never read a verse of his Ossian. As, therefore, Ossianic poetry was found in large abundance in 1861, the question naturally presents itself: How very extensive must the same poetry have been in 1760. The inference is irresistible, that MacPherson could have found, and doubtless did find, abundance of Ossianic poetry in the Highlands, and that he had no occasion, even if he had the ability, to excogitate, or, in other words, to forge, the poems of Ossian.

That the power of oral tradition is very great, so far as the perpetuation of poetry is concerned, appears very clearly from the remarks which Max Müller makes with regard to the Finns. "The Epic songs still lived among the poorest, recorded by oral tradition alone. From the mouths of the aged, an Epic poem has been collected equalling the Iliad in length and completeness. Kalevala possesses merits not dissimilar

from those of the Iliad, and will claim its place as the fifth national epic of the world."*

Campbell may be regarded as the leader of those who in our day are opposed to the contention, that MacPherson gave to the world a *bona fide* translation of poems which he collected in the Highlands, and which he doubtless corrected and collated before he published them. Campbell's categorical averment is thus expressed by him: "My theory, then, is that about the beginning of the 18th century, or at the end of the 17th century or earlier, Highland bards may have fused floating popular traditions into more complete forms, engrafting their own ideas on what they found, and that MacPherson found these works, translated and altered them, published the translation in 1760, made the Gaelic ready for the press, published some of it in 1763 and made away with the evidence of what he had done when he found that his conduct was blamed. I can see no other way out of the maze of testimony." No unkindness is done to Campbell when it is stated, that his imagination must have acted no insignificant part in leading him to the conclusion which has been cited. It will be of advantage to advert to the evidence which remains with regard to the use that MacPherson made of the material collected by him in the Highlands. Dr. Blair states that "after MacPherson returned to Edinburgh he took lodgings in a house immediately below where Dr. Blair then lived, and that he busied himself in translating from the Gaelic into English." Dr. Blair goes on to say: "I saw him very frequently. He gave me accounts from time to time how he proceeded, and used frequently at dinner to read or repeat to me parts of what he had that day translated. Gentlemen who knew Gaelic looked into his papers and saw some that appeared to them to be old manuscripts."

Mr. Alexander MacAulay, Highland chaplain in Edinburgh at that time, thus writes: "I saw the originals which Mr. MacPherson collected in the Highlands. Mr. Fraser will assure you that he saw them likewise, and was frequently present with Mr. MacPherson when he was translating them, and no man will say that he could impose his own originals upon us, if we had common sense, and a knowledge of our mother tongue. The world may say of him and his translations what they please, but I am convinced for my part that I heard most of these poems repeated since I remember anything at all." The testimony of Mr. Lachlan MacPherson, of Strathmashie, is most valuable: "I assisted MacPherson," he writes, "in collecting the poems of Ossian, and took down from oral tradition and transcribed from old MSS. by far the greater part of

* Science of Language, 1st series; 317, 318.

these pieces he has published. Since the publication, I have carefully compared the translation with the copies of the originals in my hands, and find it amazingly literal, even in such a degree as to preserve in some measure the cadence of the Gaelic versification." It is unnecessary to adduce any other evidence in order to indicate, that MacPherson did in reality translate the poems of Ossian from poetical material that he was successful in obtaining in the Highlands; and that he did not depend, as his modern assailants persist in maintaining on very insufficient grounds, on his own imagination for the thoughts and sentiments which he arrayed in an English attire and to which he was pleased to give the appellation of the Poems of Ossian. Any amount of importance is attached by his modern adversaries to the fact, that MacPherson failed, as they contend, to disclose what his MSS. were, if any, and where he found them. A certain clergyman thus writes: "When MacPherson returned from his tour through the Western Highlands and Islands, he came to my house in Brae-Badenoch . . . He produced several volumes small octavo, or rather large duodecimo, in the Gaelic language and characters, being the poems of Ossian and other ancient bards. Many of these volumes were said to have been collected by Paul MacMhuirich, Bard Chlanraonuil, about the beginning of the 14th century. Mr. Macpherson had these from Clanronald. Clanronald told me that Macpherson had the Gaelic MSS. from him."

The statement of a writer in South-Uist is to the effect, that he saw Neil MacMurrich deliver to Mr. MacPherson a MS. containing the poem Berrathon, with three or four more MSS. Neil MacMurrich and his predecessors for nineteen generations were the bards and historians of Clanronald. The testimony of Malcolm MacPherson is to the effect, that he had a brother who was noted in the country for his knowledge of the poems of Ossian; that when James MacPherson was in the country, he employed himself for four days and four nights at Portree in taking down a variety of poems from his brother, and that the latter gave MacPherson a MS. in quarto and about 1¼ inches in thickness. Captain Morrison states, that he had access in London to Mr. MacPherson's papers, and that he saw many MSS. in the old Gaelic characters containing some of the poems translated, which MSS. they found difficult to read. Lachlin MacVuirich states, that he remembers that his father had a book called the Red Book, which he had from his predecessors, and that Clanronald made his father give up the Red Book to James MacPherson. Professor MacLeod, of Glasgow, assured a friend that he had seen and examined several Gaelic MSS., partly written upon vellum, and apparently of great antiquity, in the possession of Mr. MacPherson, con-

taining portions of poetry mixed with other compositions. MacPherson wrote to a certain clergyman that he had met with a number of old MSS. in his travels, and that he had endeavoured to secure the poetical part of them. He further writes, that he has been lucky enough to lay his hands on a pretty complete poem, and truly epic, concerning Fingal. The testimony of a clergyman who resided in Mull, is to the effect that he was assured by a certain man that the latter in his younger days heard Fingal repeated very frequently in the original, just as Mr. MacPherson has translated it. Is it not apparent now, that, after all, some reliable evidence is available to show, that MacPherson found Gaelic MSS. in the Highlands, and that his modern assailants are by no means justified in dismissing with contemptuous indifference the testimony of reliable men concerning the having in his possession of Gaelic MSS. which he found during his poetical mission through the Highlands? In referring to the intimacy which he had with MacPherson in London, the famous clergyman, Dr. Carlyle, is led to remark, that he was never able to discover in MacPherson's most unguarded moments that he was any other than the collector and translator of the works of Ossian. We have the authority of Dr. Blair for believing, that MacPherson for some months left all the originals of his translations open to inspection and examination in Becket the bookseller's shop, London, and intimated by advertisement in the newspapers that he had done so. Dr. John Smith states, that the Gaelic poems of Ossian lay for a considerable time in the hands of the bookseller for the inspection of all who chose to see them; and, as if this had not been enough, they were offered to the public, had subscribers been found to encourage the undertaking. In his able Essay on the authenticity of the poems of Ossian, Dr. Graham intimates that he saw in the London Magazine for the year 1784 or 1785 an advertisement by Becket, a bookseller in the Strand, certifying that the originals of Ossian had been at his shop for subscription for the space of a whole year, but that the number of subscriptions being inadequate to the expense of publication, the MSS. had been withdrawn. As Blair and Smith and Graham were gentlemen of the highest character, and, therefore, of great veracity, we have every reason to believe that MacPherson placed the Gaelic MS. or MSS. of his Ossian in the shop of the bookseller whose name has been mentioned. If MacPherson forged the poems of Ossian, there is no likelihood whatever, that he would be bold enough to submit his Gaelic MSS. for public inspection. It is somewhat extraordinary, that his modern assailants, who cannot be accused of having an unduly modest opinion of their own acumen, should virtually ignore the fact that MacPherson did submit the Gaelic MSS. of his Ossian to public inspection; and that, consequently, it is *prima facie* absurd to suppose, that he himself

fabricated the poems which he thus exposed to possible if not certain detection, if they were merely his own workmanship.

It is surprising to know, on the authority of Dr. Graham, that corroborative evidence came from an unexpected quarter when the poems of Ossian, in their English attire, began to be extensively read. Captain Parker, who was then residing in Virginia, relates that he was well acquainted with the Rev. Charles Smith, a native of the Island of Mull, who settled near Norfolk in Virginia. A copy of Ossian's poems was sent to Captain Parker, who carried it to Mr. Smith. After a few lines from Temora had been repeated in his hearing, he remarked that he knew that poem, and repeated a great part of it and explained it with an exactness which appeared to Parker to be astonishing and scarcely credible. He acted in a similar manner in connection with several of the other poems. Mr. Smith asserted, that if he had been with Mr. MacPherson, he could have given him some other poems of Ossian well worthy of preservation; that he remembered them almost from infancy; that repeating them was the amusement of the children and servants about his father's house, and generally in all the West Highlands, and that still, walking or riding alone, he was wont to repeat them. Mr. Smith died in 1772, and was about 70 years of age at his death. The indirect testimony of Mr. Smith is very valuable, seeing that he lived far away from the scenes of his youth, and that his references to the customs with which he was familiar in his earlier years go far to strengthen the argument that has weighty evidence on its side, in connection with the extensive prevalence and cultivation of Ossianic poetry in the Highlands. Sir John Sinclair, in his very interesting Dissertation on the authenticity of the poems of Ossian, inserts a somewhat extensive correspondence which he carried on with prominent Ecclesiastics of the Church of Rome respecting a Gaelic manuscript of the poems of Ossian that existed at one time at Douay in Flanders. It appears that a Mr. John Farquharson, when missionary in Strathglass, wrote the MS. about 1745 and brought it to Douay with him, where he was for a time Prefect of Studies. A Mr. MacGillivray, who went to Douay College in 1763, affirmed that after the appearance of MacPherson's translation, the complaint among the Gaelic scholars of that College was, that it failed to do justice to the energy and beauty of the original. Mr. MacGillivray was convinced that this MS. contained all the poems that were published by MacPherson; because Mr. Farquharson remarked frequently in his hearing, after he had read the translation of MacPherson, that he had all these poems in his own collection. The testimony of another Mr. MacGillivray is to the effect, that Mr. Farquharson first saw MacPherson's translation in 1766 or 1767; and that after he had read it, he stated that he had all the translated poems in his

possession. "I have seen him an hundred times," Mr. MacGillivray adds, "turning over his folio, when he read the translation, and comparing it with the Erse, and I can positively say that I saw him in this manner go through the whole poems of Fingal and Temora." The important MS., which was at one time at Douay, was unhappily lost or destroyed amid the military disturbances which subsequently swept over that part of the continent of Europe. An accession of strength, of which too much cannot be made, is imparted by the MS. of Douay to the authenticity of the poems of Ossian, and consequently to the veracity and reliability of MacPherson. Even Mr. Campbell, who, unhappily for his lofty reputation for generosity of heart and mind, is most reluctant to award any praise whatever to MacPherson, is compelled, out of regard, doubtless, to the powerful evidence of the MS. of Douay, to admit that, "unless the statement of Mr. MacGillivray is a deliberate falsehood, there is an end of the argument which makes MacPherson the author, though no early copy of the entire poems is known."

Shortly after the publication of Temora, MacPherson accompanied Governor Johnstone to Florida, and, it is supposed, took with him the Gaelic poems of Ossian to that country. From 1773 until his death in February, 1796, MacPherson's time was much occupied in the discharge of the duties which his position as agent of the Nabob of Arcot imposed upon him. He had in contemplation to print the Gaelic poems of Ossian in Greek rather than in Roman characters. A sum amounting to £1,000 Sterling was collected in India among gentlemen who were natives of the Highlands of Scotland, and who were at that time in the East occupying eminent positions in the service of their country. Sir John MacGregor Murray took a prominent part in raising money among his Gaelic countrymen in India for the purpose of publishing the poems of Ossian in the original language. In the circular which he issued, he said, among other things, that his appeal was to "men who have Gaelic blood in their veins and Gaelic sentiments in their hearts—men who know and feel that elegant as Ossian's modern dress is, it is not equal to his native garb, and that Gaelic, barbarous and uncouth as it is represented, has expressions peculiarly nervous and sublime for every noble and exalted idea that can enlarge and elevate the human mind. The object of this address is to verify the prediction of Ossian that Fingal shall be clothed with fame, a train of light to other times." The munificence of the Gaelic gentlemen in India amounted to something like £1,200 Sterling. They exemplified in an excellent manner the truthfulness of the words of Horace:

Coelum non animum mutant qui trans mare currunt.

To a communication which was addressed to him on behalf of the Highland Society of London, for the purpose of ascertaining when he intended to publish the original poems of Ossian, MacPherson sent this reply:

NORFOLK STREET, July 4th, 1784.

MY DEAR SIR,—I received the favour of your letter dated yesterday, and I am sorry the gentlemen should think of giving themselves the trouble of waiting on me, as a ceremony of that kind is altogether superfluous and unnecessary. I shall adhere to the promise I made several years ago to a deputation of the same kind, that is, to employ my first leisure time, and a considerable portion of time it must be to do it accurately, in arranging and printing the originals of the poems of Ossian as they have come to my hands. Funds having been established for the expense, there can be no excuse but want of leisure for not commencing the work in a very few months.

MacPherson died in 1796, without fulfilling his promise, although twelve years had elapsed since the Gaels in India with generous enthusiasm contributed £1,200 Sterling for publishing the original poems of Ossian. Mr. MacKenzie, Secretary of the Highland Society of London, was appointed as one of his executors by MacPherson, and £1,000 Sterling was bequeathed to him for publishing those poems. Mr. MacKenzie died before he was enabled to complete the work which was committed to him, and to which he applied himself with great faithfulness.

Mr. George MacKenzie was the only executor who chose to serve among those whom Mr. John MacKenzie had appointed. As he could not undertake the publication of the Gaelic poems of Ossian, he transferred the MSS. to the Highland Society of London. A Committee was appointed by that society on the 17th of May, 1804, to superintend the publication of the poems in their original language. The Committee examined the MSS. and found that, although some of the smaller poems were wanting, the principal poems were extant. It was resolved to publish the poems that were already available, and to employ every diligence in order to recover such poems as were missing. The proof-sheets were revised by the Rev. Alexander Stewart, who is favourably known as the author of a Gaelic Grammar. In 1807, nearly half a century after the publication by MacPherson of his translation of Ossian, the poems of Ossian in the original Gaelic were published in three volumes, with a literal translation into Latin, as the title-page sets forth, by the late Robert MacFarlan, A.M., together with a Dissertation on the authenticity of the poems by Sir John Sinclair, Bart., and a translation from the Italian of the Abbé Cesarotti's Dissertation on the controversy respecting the authenticity of Ossian, with notes and a supplementary essay by John MacArthur, LL.D. Sir John Sinclair, who was a scholar of great

refinement, and who had an enthusiastic affection for the poetry of the Scottish Gael, terminates his elaborate Dissertation with the statement of two important propositions which he established:

1. "That the poems of Ossian are authentic ancient poetry.

2. "That in a remote period of our history, the mountains of Scotland produced a bard whose works must render his name immortal, and whose genius has not been surpassed by the efforts of any modern or even ancient competitor." There was published in 1817, another edition of the Gaelic text of the poems of Ossian, under the editorship of the eminent Gaelic scholar, Ewen MacLachlan, of Aberdeen. Another edition of the poems of Ossian in the original Gaelic was published by the Rev. Dr Archibald Clerk in 1870. That edition contains a literal translation by Dr. Clerk of the poems into English. It has likewise a lucid and exhaustive Dissertation on the anthenticity of the poems. The edition is both able and instructive. It is a singular coincidence that the Earl of Bute of that generation aided MacPherson very liberally, bearing as he did a portion of the expense of publishing Fingal and other poems, and the entire expense of publishing Temora and other poems; while the present Marquis of Bute is entitled to the credit of generously bearing the expense that was incurred by the publication of Dr. Clerk's magnificent edition of the poems of Ossian. There are other important collections of Ossianic poetry. No more honourable name than that of Dr. John Smith is to be found among the Gaelic scholars of his own generation, rich though it was in scholars of learning and critical acumen and patriotic enthusiasm. It was in 1780 that he published his Gaelic Antiquities, a Dissertation on the poems of Ossian and a collection of ancient poetry translated from the Gaelic of Ullin, Ossian, Orran, etc., in other words, an English translation of Gaelic poems which were published by him in 1787, under the designation of Sean Dana. The Sean Dana contain the purest, and in many respects the oldest and best Gaelic in the whole domain of Gaelic literature. Campbell insinuates that the Sean Dana were invented or fabricated by Dr. Smith himself, and that it is vain to look for any traces of them beyond himself. Had Campbell carefully read Dr. Smith's Dissertation, he would have found, that the latter tells in the most ingenuous manner how he was induced to prepare his Sean Dana and from whom he obtained his material. In a foot-note, Dr. Smith gives the names of several persons who aided him by oral recitation, as well as the names of other persons who acted the part of useful and faithful correspondents. "An original collection of the poems of Ossian, Orran, Ullin and other bards who flourished in the same age:" Such is the writing on the title-page of a collection of Ossianic poems, which were collected and edited by

Hugh and John MacCallum, and which were published at Montrose in 1816. A list is appended of the name and residence of the persons from whom the poems that form the collection were received.

In a letter from Ewen MacLachlan, of Aberdeen, which is inserted, these very sensible remarks are made: "If the works of Ossian are a forgery, we have sufficient grounds for believing that the imposition cannot be charged on modern times. Antiquity has ascribed the contents of your work to Ossian, as far as we can rely on the faith of Celtic MSS. and on traditions which we have imbibed with our maternal milk, and whose impressions on our minds will be as permanent as our existence." "The Dean of Lismore's Book, a selection of ancient Gaelic poetry, from a MS. collection made by Sir James MacGregor, Dean of Lismore, in the beginning of the sixteenth century:" Such is the writing on the title-page of a manuscript and a translation of the Dean of Lismore's Book which was published by the Rev. Dr. MacLauchlan, of Edinburgh, in 1862. It contains 2,500 lines of Ossianic poetry, and therefore sets forth a complete refutation of the statement of Johnson who visited the Hebrides in 1773, "that five hundred lines cannot be recovered in the whole Erse language of which there is any evidence that they are a hundred years old." "Leabhar na Feinne: Heroic Gaelic Ballads, collected in Scotland chiefly from 1512 to 1871:" Such is the designation which Mr. J. F. Campbell gave to the collection of Gaelic poetry which he published in 1872. "Reliquiae Celticae:" Such is the name which has been given to Texts, Papers and Studies in Gaelic Literature and Philology by the late Dr. Alexander Cameron. The book in question was published during last year. The editors assert that it may be called a complete corpus of Ossianic poetry. It contains an independent manuscript of the Dean of Lismore's Book. The quantity, therefore, of Ossianic poetry that is still available, is by no means insignificant.

In deference to the many objections which were raised against the genuineness of the poems of Ossian that were given to the world by MacPherson, the Highland Society of Scotland, towards the end of the last century so far as I can ascertain, resolved to submit a series of exhaustive questions to clergymen and others who resided in the Highlands of that country. The object of those questions was to ascertain whether poems similar to those which were collected and published by MacPherson still existed in the Highlands. Minute inquiry was made as to whether the poems published by MacPherson could be identified with poems that were still in circulation. The Report of the Highland Society was published in 1805. Conclusive evidence was adduced to show, that the history of Fingal and his followers, of Ossian and his poems, was commonly known, and that poems

similar to those which were published by MacPherson existed in many parts of the country and could be recited by men who had never heard of MacPherson. The Report terminates with this very decisive language concerning the prevalence of Ossianic poetry. "The Committee can confidently state its opinion, that such poetry did exist; that it was common, general and in great abundance; and that it was of a most impressive and striking sort, in a high degree eloquent, tender and sublime. The Committee is possessed of no documents to show, how much of his collection MacPherson obtained in the form in which he has given it to the world. The poems and fragments of poems which the Committee has been able to procure contain often the substance, and sometimes almost the literal expression—*ipsissima verba*—of passages given by Mr. Macpherson in the poems of which he has published the translations. But the Committee has not been able to obtain any one poem the same in title and tenor with the poems published by him. It is inclined to believe, that he was in use to supply chasms and to give connection by inserting passages which he did not find, and to add what he conceived to be dignity and delicacy to the original composition by striking out passages, by softening incidents, by refining the language—in short, by changing what he considered as too simple or too rude for a modern ear, and elevating what in his opinion was below the standard of good poetry. To what degree, however, he exercised these liberties, it is impossible for the Committee to determine." Nine hundred lines, and when the fragments are included 1,700 lines, of such poetry as that of which MacPherson published a translation, are inserted in the Report that we are now considering, Dr. Clerk is correct in his contention that from the material in their possession, the members of the Committee would be justified in drawing much stronger conclusions than they did in favour of the authenticity of the poems of Ossian. As to the utter lack of ability on the part of MacPherson to invent or forge the poems of Ossian, these citations are sufficient: "Of all the men I ever knew," writes Dr. Blair, "Mr. MacPherson was the most unlikely and unfit to contrive and carry on such an imposture as some people in England ascribed to him. He had none of the versatility, the art and dissimulation which such a character and such an undertaking would have required." Captain Morrison, who was intimately acquainted with MacPherson, writes that so far from composing such poems as were translated, he assisted MacPherson often in understanding some words and suggested some improvements, and that MacPherson could as well compose the prophecies of Isaiah or create the island of Skye as compose a poem like that of Ossian's. The Committee of the Highland Society showed no partiality whatever to MacPherson in the several ingenuous

asseverations which the Report contains regarding the manner that he adopted in all likelihood in arranging his material. It is obvious that, as many versions of the same poem or episode were current, owing to the universal tendency of oral tradition, MacPherson was compelled out of regard to lucidity and continuity of thought and sentiment, to make a judicious rearrangement of the poems or fragments of poems that fell into his hands. Pisistratus, or whoever collected and arranged the poems of Homer, must have followed a similar plan in the arrangement of the Homeric poems that came into his possession. There is, and must be, however, a wide diversity between such an arrangement of poetical matter that was available, and between the excogitation of such poems. Campbell is profuse in his admissions that traditional poems in abundance, written or unwritten and attributed to Ossian, were current in the Highlands and accessible to MacPherson. His grave objection is, that the Gaelic Ossian of 1807 and the Sean Dana of 1787 are almost unknown to the class that recite Gaelic poems which they attribute to Ossian. "The Sean Dana and the Gaelic Ossian are nowhere to be found in any of these collections made from the people." The modern opponents of MacPherson and of the Sean Dana fail, it is very much to be feared, in assigning its due significance to the fact, that almost half a century intervened between the translation of the poems of Ossian by MacPherson and the publication of the Gaelic Ossian—to employ Campbell's own phrase. During so long an interval, much useful poetical material must have been irrecoverably lost.

As a century, with all its changes and transformations in the Highlands of Scotland, intervened between MacPherson's poetical mission through the Highlands and the laudable labour of Campbell in gathering the material of Leabhar na Feinne; no injustice is done to Campbell when it is contended, that he must of necessity have been an imperfect judge of the facilities which MacPherson must have had in preparing the poems of Ossian for publication. And when every deference is made to the frequent allegation of Campbell, that he failed to find Gaelic similar to that of the Gaelic Ossian and the Sean Dana, it surely does not follow that such Gaelic did not exist, unless, indeed, we are to concede that Campbell had accurate knowledge of all the Gaelic that was either spoken or written in Scotland during the long years that passed between 1760 and 1872. It would surely be a violation of all honest criticism to admit, that poems must necessarily have been invented or forged, because, forsooth, an enthusiastic lover of his country's literature did not discover amid all his efforts to disentomb the records of an almost forgotten past, any poetry to correspond exactly in language and sentiment with those poems. Every Gaelic scholar will at once perceive that the Gaelic of

the Sean Dana and of the Gaelic Ossian is far more beautiful and musical than the Gaelic of Leabhar na Feinne; and that, indeed, the classical Gaelic of Scotland is to be found in those two books or collections. It has to be boldly and confidently maintained, that the modern assailants of MacPherson and Dr. Smith must produce much stronger arguments than the airy sentimentality in which they indulge, before they can convince any honest student of the entire controversy regarding Ossianic poetry, that those two men were forgers or literary impostors and nothing more.

It must be granted, in all candour, that were he so disposed, MacPherson could easily have lessened or avoided altogether the severity of the opposition which he had to encounter in connection with the poems of Ossian. It is evident, that he had a remarkable measure of that lofty independence and pride that lives on through every generation in the hearts and minds of the race to which he belonged. Who could blame him for thus reasoning, when Hume and Johnson were levelling the shafts of ridicule and disparagement against him, that, as he was successful in gaining a reputation in the world of letters, perhaps more enviable and more extensive than their own, he could afford, in obedience to the warmth of his Highland pride, to ignore themselves and their persistent abuse? It may be fairly held, that much of the Ossianic poetry which he once possessed, was lost during his sojourn in Florida, and while he was engaged in the discharge of important official functions, which must have occupied very much of his time and attention. Nor is it at all unlikely, that Gaelic poems of much value were mislaid and ultimately lost, during the time that passed between his death and the transmission to the Highland Society of London of all the material that remained.

Very forcible is the opinion of the Abbé Cesarotti: "But whatever may be thought on the subject, the works of the Celtic Homer (Ossian) do exist. They are all of the same brilliant and harmonious colouring, and they have a certain author. Let the author have existed in the times of Caracalla or of St. Patrick; let him be a native of Morven or of Ulster; let him belong to the family of a petty king or to that of a simple Highlander, it is all the same to those who consider him in the light of a poet. Let such as do not like to name him Ossian call him Orpheus. Doubts may be entertained whether Fingal was his father, but no one will say that he was not the son of Apollo." "I confess," says Dr. Blair, "I cannot avoid considering the discovery of the works of Ossian as an important era in the annals of taste and literature, and the share which I have had in contributing towards it as a part of my life by which I have deserved well of this age and posterity."

NIAGARA LIBRARY, 1800–1820.

BY JANET CARNOCHAN.

(Read 6th January, 1894.)

It says much for the members of any community when we find them providing reading of a high literary order, and especially would this be the case, at the beginning of this century, among a band of refugees just emerged from a great struggle, with the forest around them and everything speaking of a new country and all that is implied in this.

When by the merest chance, some months ago, I laid my hands upon an old, brown, leather-covered Record Book, I had no idea of the rich treat it was to prove. To my astonishment, by dint of much patient study of its thick, yellow pages covered with writing, though large yet very difficult to read, it was shown that in this old town of Niagara in those early days there was a most valuable public library well supported, the accounts showing regular payments and much interest, as evidenced by the money contributed and the regular records. To the boast made by Niagarians that here was held the first parliament for Upper Canada, that here was published the first newspaper, that it contains almost the oldest church records in Ontario, must now be added the honour of having had the first public library, and the first agricultural society. The varied information to be gleaned from this book may be thus classified: 1st, a list of proprietors through the years from 1800 to 1820; 2nd, list of their payments and those of non-subscribers; 3rd, catalogue of library with prices of books; 4th, money expended; 5th, rules and regulations; 6th, account of annual meetings, contingent meetings, etc.; 7th, list of books taken out and date of return; 8th, alphabetical list of subscribers with separate page for entries for each during these years. When we think of the vicissitudes of the years 1812, 1813, 1814, and of the stirring events which took place here, military occupation by friend and foe, of fire and sword alternately doing their cruel work, we wonder how this library was preserved, for preserved in part at least it was, for the issue of books goes on, a new catalogue with spaces left perhaps for books missing, and in the accounts sums are paid to replace particular books. It is interesting to follow up the period of the war and in all these divisions note the latest entry, and then following an interval of two years without the break of a line even left as space

between such deeds as the glorious death of the Hero of Upper Canada, the rattle of guns and roar of cannons, the flight over frozen plains, watching the smoking ruins of once happy homes, still go on in the same handwriting, the payment of money, the purchase of books, the annual meetings, etc. It may be doubted if in this day of boasted enlightenment we are willing to pay so much for our reading. One thing at least is certain, against the proprietors of this library cannot be made the charge of light reading now brought so justly against the frequenters of modern libraries. Nothing light or trashy can be found on the list. Theology, history, travel, biography, agriculture, a little poetry, and later, a small amount of fiction. We in these days can almost envy the people of that time for the delight they must have experienced when "Guy Mannering" and "Waverly" appeared, for they knew that the Great Magician of the North was still alive and was sending out regularly those delightful stories, while we can never again hope for such pleasure as the first reading of these books evoked.

In glancing over the list of subscribers we meet with names of many who played no insignificant part—the church, the army, the civil service, the yeomanry, are all represented. We find several names from Fort Niagara, U. S., and also several names of women. Were there nothing in this book but the list of names, this alone would be valuable. It seems strange to think that after all these years we can now take the name of a noted man of those days and follow it up through these pages, tell what style of reading he preferred, when a particular book was taken out, when returned, how he paid his fees, when he attended the meetings of managers, and many other particulars. How little did they think that they were thus providing for us a very interesting page of history now!

The first entry is: "Niagara Library, 8th June, 1800. Sensible how much we are at a loss in this new and remote country for every kind of useful knowledge, and convinced that nothing would be of more use to diffuse knowledge amongst us and our offspring than a library, supported by subscription in this town, we whose names are hereunto subscribed hereby associate ourselves together for that purpose, and promise to pay annually a sum not exceeding four dollars to be laid out on books as agreed upon by a majority of votes at a yearly meeting to be held by us at this town on the 15th August annually, when everything respecting the library will be regulated by the majority of votes.

Andrew Heron.	Wm. Musgrove.	G. Drake.
John Kemp.	Silvester Tiffany.	Wm. Hodgkinson.
John Boyd.	Burgoyne Kemp.	John Jones.
John Young.	John Harrold.	Alex. Stuart.

John McClellan.	John Chisholm.	Peter Ten Brouk.
John Burtch.	John Hardy.	Transferred to J. T. B.
Hugh McLaren.	John Reilley.	J. McFarland.
Wm. Dorman.	Ebenezer Cavers.	John Hill, jr.
Martin McLellan.	Peter Thomson.	Robert Addison.
Thomas Kerr.	John Willson.	Benjamin Pawling.
John Young.	Peter McMicking.	Robert Nelles.
Arch. Thomson.	George Keefer.	Daniel Servos.
Thos. Otway Page.	George Young.	John Decow.
Wm. Drake.	John Smith.	J. Murray.

41 subscribers at 24*s.* each £49 4*s.*, carried to account current page B. 15 August, 1801."

Of the original forty-one the names of only four can now be found in the vicinity, though descendants of several others may be found under other names.

The first on the list, Andrew Heron, was the secretary and treasurer of nearly all the period of twenty years. Robert Addison was the first minister of St. Mark's. Silvester Tiffany was the printer of the "Constellation," which followed the "Upper Canada Gazette." Then follows another list, continued down to 1820, of thirty-four names, making altogether seventy-five, in which we recognize other names.

George Forsyth.	John Powell.	John McNabb.
Robert Kerr.	Robert Weir.	John Robertson.
John Wales.	R. Hamilton.	George Read.
Charles Selick.	Wm. Dickson, A.C.	Robert Mathews.
Colin McNabb.	James Muirhead, A.C.	Dr. West.
Wm. Ward.	Thomas Powis.	J. P. Clement.
T. Butler.	Thomas Butler, A.C.	James Secord.
Wm. McClellan.	Isaac Swayzie.	Wm. Musgrove.
Alex. McKie.	John Symington, A.C.	R. C. Cockrell.
Wm. Mann.	Israel Burtch.	Tubal Parr.
George Havens.	John Ten Brouk.	Ensign Barnard.
John McEwan.	John Silverthorn.	Wm. Claus.

In this list we find the familiar names of Butler, Claus, Dickson, McNabb. That of Swayzie has been made familiar in the name of a delicious russet apple only found in this vicinity and probably first grown on the farm of this patron of our library. Dr. West was from Fort Niagara, and ten names on this list are quite familiar to us yet.

Now follows the account of the first annual meeting held on 15th August, 1800, when it was

"Resolved, that Andrew Heron and Martin McClellan be made commissioners to arrange the business of the society till the annual meeting

to collect the subscriptions and lay it out in books to the best advantage, and that they act by the following rules :

RULE I.

To receive from every subscriber three dollars and no more..

RULE II.

As soon as thirty dollars is collected to lay it out on books, none of which shall be irreligious or immoral.

RULE III.

Every subscriber may, if he chooses, when he pays his subscription, make the choice of a book not exceeding his subscription, which shall be procured for him with all convenient speed, provided nothing irreligious or immoral is contained in the same.

RULE IV.

As soon as a number of books can be procured, not less than fifty volumes, every subscriber shall be entitled to receive any book that remains in the library that he chooses, which he shall return in one month in good order.

RULE V.

No book shall be allowed to any of the subscribers unless they have first paid their subscription."

Here follows a catalogue of books received into the library 2nd March, 1801, No. 1 to 80.

It is remarkable that the first thirty volumes are all of a religious nature, volumes 1, 2 and 3 being Blair's Sermons, and 4 and 5 Walker's Sermons, 9 and 10 Fordyce's Sermons to Young Women ; the names of Watts, Bunyan, Boston, Newton, Doddridge, Wilberforce, Watson, Owen and Willison are seen. An attempt is even made to give proper guidance to young people in an important crisis of life—as No. 28 on the list is Religious Courtship. It is not till we reach No. 34 that we see any history, travel or poetry. This first purchase of eighty volumes, costing £31 17*s*., furnished the young people in these forty homes in poetry only Ossian, Cowper's Task, Campbell's Pleasures of Hope, but they might revel in the Citizen of the World and the Rambler, Bruce's Travels, or Robertson's History of Charles V., and if Religious Courtship pleased them not as No. 28, No. 70 is simply Letters on Courtship. The only work of a less specific gravity is No. 73, The Story Teller, which no doubt was popular with the children of those households. The catalogue goes on during the years, up to 937, and contains many expensive works ; then follows a list of payments for books, and money received for dues, and several pages are then occupied with the account of the annual, always spelled Annuall, meetings. These always took place on the 15th August, and the record goes on without any break, except the year 1813, when the town was in the hands of the Americans,

and 1814, when heaps of ruins replaced happy homes; also 1819 no meeting was held. The question as to how many of the books were preserved and how they were saved is yet to me an unsolved problem. Of course a large number were in circulation in the houses of the town and township; while some would be burnt, others would be saved; but it is certain that a great many of the books in the library were not burnt, as afterwards from the issue of books, from the numbers given as taken out and returned day after day, it may be seen what books were not destroyed. That many were destroyed or lost is certain, as in the accounts for next year the names of many books are given as to replace those lost. There is a new catalogue with spaces left.

To resume the account of meetings.

"Niagara. Library Annuall Meeting, No. 2, held this 15th day of August, 1801. Resolved, that in addition to the two trustees who have acted last year two others shall be chosen, to act jointly with them for the year ensuing, and in the next annuall meeting two others shall be chosen to act with these four, and afterwards yearly two fresh ones shall be chosen, and the two oldest shall go out in such a manner as to have always six acting trustees, and at all meetings for transacting business the trustee present who shall be oldest on the list shall take the chair."

Rev. R. Addison and Mr. John Young were the additional trustees this year. "Old members to pay $2, and new members $4." Members who lived out of town were allowed to take two books at once, the time of returning to be extended to six weeks to those in the township, and to those out of the township two months. "Members neglecting to return a book at the proper time to pay a fine of sixpence currency for every week of detention, also if any book be lost, the member to whom it was given shall pay for it at the original cost, if it belongs to a set the whole set to be paid for by the member who lost it, he being entitled to the remaining volumes.

"Resolved, that all members who shall not pay the two dollars above mentioned within six months from this day shall be suspended. Resolved, that every member who shall withdraw from the Society shall have a power of giving his right to any other person approved of by the trustees. Resolved, that the trustees shall meet quarterly, viz., on the second day of every Quarter Sessions of the Peace, and contingent meetings shall be called by the chairman at the request of any two of the trustees."

"Quarterly meeting held at Niagara, 14th October, 1801. Present, Martin McLellan, Rev. R. Addison, Jno. Young. Adjourned till the

next quarterly meeting held at Niagara, 13th January, 1802. Present, Andrew Heron, Martin McLellan, Rev. R. Addison, Jno. Young. Books in catalogue from 118 to 150 received at prices annexed, and that George Young shall make a case for the books, for which he shall be paid a reasonable price." This we find in the accounts to be £5 2*s.*

At the quarterly meeting, April 14th, 1802, "Ordered, that Mr. Tiffany print the laws of the Society, and be allowed three dollars for the same, and deliver not less than seventy copies to the trustees, one to be given to each subscriber, and that Mr. Murray be allowed one dollar more for Robertson's History of Charles V."

At the annual meeting, August 14th, 1802, No 3, "Robt. Kerr, Esq., and Mr. Jno. Hill, trustees added." A stringent law is passed that "that part of the fifth resolution of the second meeting of the Society which directs that every member who shall neglect to return the books shall pay into the hands of some one of the trustees sixpence currency for every week he continues to hold the same after the time limited is expired, be enforced by the librarian, he not being at liberty to let him have another book until that sum is paid, and that that be extended to every person, whether member or not."

New members were this year to pay $5, and next year this was raised to $6. In 1804 comes the first payment to the librarian, and this is certainly a modest allowance. This library seems to have solved the difficulty of keeping down the expenses, as through all these years there is no outlay for firewood, for rent, for light—the allowance to the librarian being a percentage on money paid by what are called non-subscribers. The original members are called sometimes proprietors and sometimes subscribers.

"Resolved, that Andrew Heron be librarian for the ensuing year, and be allowed 12½ per cent. of all the moneys collected for the last twelve months from non-subscribers, and the same for the year to come, and shall be obliged to make good all the books that may be lost by non-subscribers."

This seems very hard on the librarian, but he must have been a book-lover, for through all these years he remained faithful to his trust—the emolument sometimes being £1 7*s.* 6*d.*, sometimes £2 12*s.* 6*d.* For the year 1817 it was only 5*s.* 7*d.*, and the largest amount was £6, which for those days must have been munificent. In 1804, books admitted from 316 to 344, and in January, 1805, quite an addition was made to the library as well as to the members of the society, which item tells us what

we had seen mentioned elsewhere of the existence of an Agricultural Society with a number of valuable books.

"Resolved, that the books mentioned in the catalogue from 348 to 397 be received from the Agricultural Society at the annexed prices, and that in lieu of them the arrears of Robert Kerr, Robert Addison, George Forsyth, Colin McNabb and Robert Hamilton be remitted to them, and that a share in the library be given to Wm. Dickson, James Muirhead, Thomas Butler, John Symington and Joseph Edwards at £2 8*s*. each, all these sums amounting to £16 8*s*."

In 1805, the trustees are John Kemp, Martin McLellan, John Young, John Waterhouse, Alex. McKie, Wm. Mann, and evidently it is found difficult to enforce the rules, for it is "Resolved, that each and every of the laws and regulations made at the last annual meeting shall continue for the year ensuing the same as they were made." At a contingent meeting, 12th November, 1805, "John McNabb be admitted as member as one of the Agricultural Gentlemen, and Ralph Clench."

At annual meeting, No. 7, August 15th, 1806, Geo. Reid and John Grier, the two new trustees; each proprietor to pay $1 a year; a share, always spelled shear, to be sold at $6.50. "Resolved, that Jacob A. Ball and Lewis Clement be admitted to a share in right of their fathers as members of the Agricultural Society, those gentlemen already having purchased shares, and that Jane Crooks, eldest daughter of the late Francis Crooks, be admitted to a share in right of her father as a member of the Agricultural Society."

Thus history repeats itself. As the daughters of Zelophehad demanded that the inheritance of their father should pass to them, Miss Crooks, over three thousand years afterwards, makes the same claim, and is as successful in obtaining her share of current literature as they in obtaining their share of land. This is not the only woman's name on the list, as we find in 1815 list the name of Miss Hill in place of her father. Also in list of payments the names of Mrs. Sluny, Fort Niagara, N.Y., 6*s*., Mrs. Stuart, one year, 15*s*.

Members in town were now allowed to take out two books at once, 500 tickets were to be procured with all convenient speed to continue the number to be pasted on each book as entered.

"At annual meeting, No. 8, 1807, shares to be sold at $7.00 each. Resolved, that one hundred copies of the catalogue be printed, and one copy to be given to each proprietor, and also one hundred copies of an abridgment of the laws, if it can be got done on reasonable terms."

"A contingent meeting, 24th Oct., 1807. Present, Alex. McKie, Wm. Mann, Robert Kerr, Jas. Muirhead, Geo. Reid, John Grier. Ralfe

Clench, Esq., offers to take charge of the library on being allowed his proportion of the annual payment. Resolved, that his proposal be accepted if he keep the library open from 10 to 12 o'clock every day, Sundays excepted. Ordered, that Mr. Jas. Turlin's proposal to make a book case, the same as we have, for $12 be accepted." The first book case was £5 2*s.*, so that prices must have decreased.

"A contingent meeting, August 1st, 1808. Andrew Heron having prepared a room for the library and offers to perform the duties of librarian, and be answerable for the books that may be missing as usual, Ordered, that his offer be cheerfully accepted. N.B.—Mr. Clench refusing to give up a *kay* to the library, A. Heron will not become responsible for the books that may be missing."

From October, 1807, the entries of books are in an entirely different hand, but Mr. Heron still visited the loved books, for the name frequently occurs, and the next year the entries go on in the same large hand. The little difficulty of the key must have been settled. In the catalogue, books 568 to 611 are entered in a different hand, which is the period of Mr. Clench being in office.

Annual meeting, No. 9, August 15th, 1808. The new trustees are Hon. Robt. Hamilton and Mr. Jno. Symington. Members out of town to be entitled to three books at a time. "Resolved, that Andrew Heron be librarian and treasurer."

Annual meeting, No. 10, August 15th, 1809. Rev. Jno. Burns, minister of St. Andrew's, and John Powell to be the two new trustees, and in place of Hon. R. Hamilton, deceased, John Wagstaff. Shares to be sold at eight dollars. Whether from the liberality of Mr. Heron in providing a room, or from his length of service, or some other reason not known, at this meeting it was "Resolved, that the librarian be entitled to receive 25% of all the money collected from non-subscribers and fines"; the additional title of clerk is now also given, thus, "A. Heron to be librarian, treasurer and clerk."

Annual meeting, No. 11, August 15th, 1810. "Resolved, that attendance on the library be required only one hour, from eleven to twelve on Tuesdays, Thursdays and Saturdays in every week."

Annual meeting, 15th August, 1811. The trustees this year are James Crooks, George Reid, Rev. John Burns, John Powell, James Muirhead and Martin McLellan. Shares are sold at $9—$1 to be paid by each proprietor and $3 by others, or $1 a quarter.

Annual meeting, No. 13, August 15th, 1812. Proprietors to pay $2 each. Books admitted at a contingent meeting 15th November, 1812, shortly after burial of Brock; books admitted, 781 to 827.

The next entry is 15th August, 1815. What a different state of affairs from that of 1812, when war had been declared and Brock was marching to Detroit; or from 1813, when an enemy held the town; or 1814, when the rubbish of bricks was being taken to build Fort Mississagua! But with intrepid courage our trustees meet and make arrangements for the work of the library going on as usual. The trustees were John Symington, George Young, James Crooks, John Burns, George Reid, Andrew Heron. Notwithstanding all the losses incurred by the townspeople, the charges are made somewhat higher, each proprietor to pay $2.50. Shares to be sold at $9, and non-proprietors $4 a year, or $1.50 a quarter, or $1 a month. At a meeting, 22nd January, 1816, books admitted, 882 to 90

Annual meeting, No. 15, August 15th, 1816. "Resolved that John Wray be librarian and clerk."

Quarterly meeting, 9th October, 1816. Books admitted, 901 to 909.

Annual meeting, No. 16, August 15th, 1817. "Resolved, that the meeting being thin that no new trustees shall be chosen, and shall remain to act as last year. Shares to be sold at $10." There seems to have been some difficulty about books circulating too much, as witness the next: "Resolved, that any proprietor or other person who receives books out of the library and allows any person to take them out of his house shall for every offence pay to the librarian £1 currency."

Annual meeting, No. 17, August 15, 1818. "Resolved, that the meeting being thinly attended no new trustees shall be chosen. All regulations remain as last year."

At a meeting of the trustees, held on 1st March, 1820, present John Burns, George Young, James Crooks and And. Heron, "Resolved, that whereas Andrew Heron offered to take charge of the books belonging to the library, that the books shall be transmitted to his house with all convenient speed, and shall there be inspected by Andrew Heron and James Crooks as soon as can be conveniently done."

Here is the record of the last meeting of the trustees of this library. "Whereas the Niagara library has been greatly wasted, first by being plundered by the army of the United States, and has since been greatly neglected, very few of the proprietors having paid their quota to support the same, we, whose names are hereunto subscribed, hereby relinquish our claims on the same to Andrew Heron (who has now opened a library of his own for the use of the public) in consideration of his allowing us the use of his library for three years; this he engages to do to all those who have paid up their yearly contributions to the year 1817 inclusive; to those who have not paid to that period he will allow according to

their deficiency in those payments. We consider those propositions as quite fair, and do thereto assent."

JAS. CROOKS,	JNO. MCEWAN,
J. MUIRHEAD,	J. BUTLER,
JNO. SYMINGTON,	GEO. YOUNG,
JNO. WAGSTAFF,	JNO. GRIER,

JOHN POWELL.

In turning now to the account of money expended and received, it tells something of the love of books in those days that, from the year 1801 to 1818, there was expended on books for this library about £500, the first outlay being £46 17*s.* on August 15th, 1800. The record book itself cost £1, and Mr. Tiffany received for printing £1 4*s.* In reading the rather monotonous account of money paid yearly, monthly, or quarterly, we sometimes meet with a pleasing variety, as books sold by vendue, spelled vandue, fine for detain of books, money to replace a book lost, books and tracts presented, a book of sermons sold to some sermon reader. The list, scattered over many pages, of money expended for books is interesting.

	£	*s.*	*d.*
1801	46	17	0
1802	27	4	6
1803-4	92	10	6
1805	34	8	1
1806	36	8	0
1807	20	19	3
1808-9	20	13	3
1810	31	12	6
1811	43	4	3
1812	21	16	6
1815	24	4	6
1816	15	5	6
1817	43	6	7
1818	17	2	6

SUBSCRIPTIONS PAID.	£	*s.*	*d.*
1801—41 subscribers	49	4	0
1806— 5*s.* from 35 subscribers	8	15	0
1807— 5*s.* " 41 proprietors	10	5	0
1808—10*s.* " 44 "	22	0	0
1809—10*s.* " 42 "	21	0	0
1810—10*s.* " 44 "	22	0	0
1811—10*s.* " 45	21	5	0
1812— 5*s.* " 42	10	10	0
1815—$2 " 25	12	10	0
1816—12*s.* 6*d.* " 13	8	2	6
1817—12*s.* 6*d.* " 15	9	7	6
1818—12*s.* 6*d.* " 8	5	0	0

This sum of £500 does not give all the outlay for books, as many single books are entered alone and not in this way. The modest emolument of the librarian may be seen in the following list, culled from many pages, he receiving a per centage on all sums paid by non-subscribers and fines, the sum varying from 5*s.* 7*d.* one year to £6, but generally less than £2, the whole payment to librarian during these twenty years being £24, so that his must indeed have been a labour of love.

	£	*s.*	£	*s.*	*d.*
In 1804—12½ per cent. on	11		=1	7	6
1805— " " "	11		=1	7	6
1806— " " "	9		=1	2	6

	£ s.	£ s. d.
In 1807—12½ per cent. on	9	=1 2 6
1808— " " "	6 5	= 13 6
1809— " " "	10	=1 5 0
1810—25 " "	9	=2 5 0
1811— " " "	10 10	=2 12 6
1812— " " "	10 10	=2 12 6
1815— " " "	24 0	=6 0 0
1817—12½ " "	2 5	= 5 7
1818—25 " "	13 15	=3 8 9

It would be interesting to us to know how so many books were saved. It is known where Mr. Heron lived in the time of the war. The story is told that his wife, with infant, was carried out on the street from a house in the centre of the town. It is likely, as there were forty subscribers and perhaps as many more non-subscribers, and each person might have out three books, there might be two hundred books in circulation, many of which might come back. Then as many articles of furniture were saved, being carried out to the street, many of the books might be saved from the library. The new catalogue gives a list of two hundred with spaces left between. The spaces I at first thought represented books missing, but I have now concluded that the numbers given represent books bought to replace the old ones burnt or lost, as very often the prices are different from the first catalogue, and that the spaces represent books either in the library or if lost not replaced, as in the list of issues of books after the war many numbers occur representing books in these spaces.

It may be worth recording, as forming another link in the history of our library, a strange coincidence which occurred while writing this paper, by which one of the books was heard from. So far I had not met a single person who had even heard of the existence of the library, but calling on an old lady a resident of the town, to inquire about it, a postal card was produced received that day from Ancaster, with this question, "Can you tell me anything of a public library in Niagara when the town was burnt, as I have a book which was the only one saved from the fire." I have since then seen the book. It is number 51 in the catalogue, Blossoms of Morality, or Blossom on Morality, and is remembered by the owner as charred with fire; but these burnt leaves are now torn away, and on an inner page is written, "This book was saved by my father, who was an officer in the British army when the town was burnt, December, 1813. The only book saved from the library. Thomas Taylor." As a matter of fact it is the only book in existence of which we know anything, but it might be worth inquiry if other books can be found belonging to the library, or what became of the library

after it came into the hands of Mr. Heron. We know that he kept a bookstore and published the Gleaner newspaper, bound copies of which for the year 1818 are in homes in the town. Also a copy of Mavor's spelling-book printed by him, with catechism of Church of England at the end, second edition date not plain, but some time after 1800. On another sheet of the record book, headed subscription paper number two, the exact words of the first page of book are copied and the names John Wagstaff, Richard Cockrell, James Hyslop, William Musgrove, Lewis Clement, Wm. Ball, Wm. Forsyth, Wm. Robertson, Alex. Rogers, Andrew Brady, Jas. Patterson, 16th August, 1815 : to these are added afterwards A. Heron, T. Symington, P. Ball, W. Hodgkins, T. Jones, J. Muirhead, George Young, W. Burtch, John Robinson, George Reid, Geo. Havens, J. McEwan, Miss Hill. In 1816, names added are, Thos. Butler, Jas. Heron—a sadly diminished list of twenty-seven.

It is intensely interesting to follow all the different divisions of contents through so many years. There was no meeting in 1813, 1814, 1819. Books were taken out up to May 24th, three days before the town was taken. John Dodd paid 5*s*. and Capt. Roxborough 5*s*. There are few records while in possession of U. S. troops, but some money was paid and a few books taken out. "June 18th, 1813, Capt. Dorman, U. S., made a payment, three months, 5*s*." (there is a Wm. Dorman in first list of proprietors). In 1814, March, J. Rea, Ensign, 100th Regt., 10*s*., and the names of John Valentine, 100th Regt., and Jno. Gibson, Field Train Department. Then in 1815, different payments from officers, as Col. Preddy, Col. Harvey, W. E. Athinleck, Hospital Asst. Then Dep. Asst. Com. Gen. Lane, Capt. McQueen, Maj. Montgomery, Major Campbell, Lieut. Vigoreux, Col. St. George, Thos. Cummins, Sergt. 41st Regt., Capt. Claus, Capt. Lyons, Lieut. Vanderventer, Ensign Winder, Capt. Saunders, Capt. Reid, of Fort Niagara, Sergt. Jenkins, Fort Niagara, Dr. West, Fort Niagara, had a share in 1806. Many strange names occur. In the course of my reading the other day occurred the name of Jedediah Prendergast, and singularly enough from the thick, yellow pages of this record stands out conspicuously this identical name, Jedediah Prendergast. But in list of money paid we find Dr. Prendergast, also the names of John Easterbrook, Benj. Wintermute, Louis Dufresne. It is singular that the accounts are kept partly in Halifax currency, partly in York currency, and partly in dollars and cents. In the pages carefully ruled for proprietors, different years, the yearly payment is given as 10*s*. or 5*s*., as the case may be, while in the other list these are entered 16*s*. and 8*s*. In many cases the right of proprietorship is transferred to another. In 1815, several books are bought to replace those missing, such as Spectator, Burns' works, Don Quixote, and in 1816,

Joseph Andrews, Robertson's America, Watt's Improvement, Humphrey Clinker, Children of the Abbey, Josephus, Walker's Sermons, but Porteous' Sermons sold for 10*s*. In 1816, "by amount of books sold at vandue, £27 12*s*. 2*d*., N.Y. cy., £17 5*s*. 1*d*." In 1817, "received for damage done to Life of Wellington, 17*s* 6*d*., Blackstone's commentaries, old copy, paid for being lost, £1 19*s*." These seem high prices for injury to books. "December 17th, 1804, received from Pte. Nicklon a fine for keeping a book eighteen weeks at 6*d*. sterling, 14*s*. 4*d*." Poor private, the law said 6*d*. currency, but from his scanty pay he is compelled to disburse this heavy tax.

One entry defeated every effort to decipher it till a happy guess makes it read, "November 12th, 1815. To a Gownd to Mrs. Nulin for taking care of books 15*s*. 6*d*." Happy Mrs. Nulin, were she fond of reading, for not only might she gratify her inclination, but she also receives a *Gownd* as a reward. There seems in the last years to be a deficit, expressed as balance due A. Heron £11 9*s*. 9*d*. in 1818, showing our treasurer to have been a man of means, as shown also in the record book of St. Andrew's church, of which he was treasurer, when there was a balance due of £176. The last entries are, "By cash received from Mr. Smith for detain of books over the limited time, April 19th, 1819, 7*s*. 6*d*. Aug. 18th, By cash, Mr. Crysler, for detain of books over the limited time, 5*s*." There are frequent entries of books presented, also tracts. In the catalogue, No. 444 is Abelard and Heloise, presented by Mr. Alexander Cameron, student-at-law. There are altogether 102 names of proprietors, the largest at any time being 45, in 1811, and the smallest eight, in 1818. Among the books in the catalogue are, in poetry, Pope's works, 10 volumes, £2 10*s*.; Shakespeare's, eight volumes, £2 12*s*.; Milton, Johnson, Dryden, Virgil, Thomson, Spenser, Ramsey, Burns, Scott. Fifty volumes on Agriculture, many of them very expensive works, came in 348–398 from Agricultural Society, although in report for 1892 Hon. John Dryden said the first Agricultural Society was formed in 1825.

Hume's History of England, continued by Smollett, 21 volumes, £7 4*s*.; Bruce's Travels, eight volumes, £7 4*s*., also Cook's and Ansons' Voyages. The library was especially rich in works of travel and in magazines; regularly every year are catalogued, European Magazine, Edinburgh Magazine, Edinburgh Review, Scot's Magazine, Lady's Magazine, British Critic, Annual Register. The British Theatre, 25 volumes, £11, might cause some of our book committees to hesitate in these days, though it staggered not our brave proprietors of those early times. Altogether we think we have much reason to congratulate these pioneers of civilization in this peninsula that such a taste was shown for reading

of such a high order, and express the hope that the libraries of the future may be as well selected, that the public may make as great sacrifices and support as liberally these aids to culture, and that many such secretaries and treasurers may be found willing to give time and faithful service to secure good literature, not only for the present, but to hand down to those to come.

A few words may be pardoned in relation to other libraries in the town. A most interesting and valuable collection of books is to be found in the rectory of St. Mark's church, consisting of about a thousand volumes, with many folio editions quite rare. These were formerly the property of Rev. Robert Addison, sent out by S. P. G. Days—nay, months—might be pleasantly spent in loving examination of these rare editions from Leyden, Oxford, Geneva. Well was it that they were not in any house in town in December, 1813, but being at Lake Lodge (about three miles out in a log house, part of which may yet be seen) they were saved. They were lately in possession of Dr. Stevenson, but by the zeal of the Venerable Archdeacon McMurray they were procured and placed in the rectory. Every book has placed in it this inscription: "Presented to St. Mark's church by the heirs of the Rev. Robert Addison, to be the property of that church in perpetuity." There are altogether fifty-three folio volumes, many of them being specially interesting. One of these, the complete works of George Buchanan, 1715, poems, Latin works, History of Scotland, a Satyr on Laird of Lydington, printed 1570, all in one volume. Hooker's Ecclesiastical Polity, 1598. One folio has been well or rather much used; it is Historical, Geographical and Poetical Dictionary, 1694. No doubt many came, allowed by the kind old man, to consult its pages. On the first leaf, these words show that there were in those days restrictions on the publication of books (these were not removed till the time of William III.): "Whitehall, 28th January, 1691/2. I do allow this work to be printed. Sydney." Jeremy Taylor, Polemical and Moral Discourses, 1657; Burneton, 39 articles, 1700; Machiavelli's Works, 1680; Spottiswood's History of Scotland, 1666; Fuller's Holy State, 1642; Montague's Essays, 1632; Fiddes' Life of Cardinal Wolsey, 1724, with copper plates, one being View of Kitchen of Cardinal's Cottage, Christ Church. Another volume is Historical Collection, Rushworth, 1659, with strange picture of James I., and the awe-inspiring legend "Touch not mine anointed" bringing up thoughts of the length to which this doctrine was carried by that unhappy race. A prayer book, Breeches Bible, 1599, in black letter, and Psalms, version of Sternhold and John Hopkins, all bound together. In the prayer book is the prayer offered "That it may please thee to bless and preserve our Most Gracious

Sovereign Queen Mary, Prince Charles, and the rest of the *Royal Progenie.*" This book has been rebound in vellum.

Other works are Xenophon's Cyrus, 1713; Virgil, 1576; Quintillion, Oxford, 1692; Tillotson, 1675; Poli. Synopsis London (Poole's), 1669; five volumes, folio, Matthew's Commentaries, Plutarch's Morals, 1603; Xenophon's Cyrus, Cicero's works in Latin. A few others at random—Shakespeare, 1771; Spectator, 1726; Jonathan Edwards, 1699; Cicero's Orations, 1590; Lord Clarendon's, 1676; Latin Funeral Orations, 1611; Greek Grammar, 1683; Pope's Iliad, 1721; Erasmus, Rotterdam, 1526; New Testament (French), Geneva, 1577; Pliny's Epistles, 1640; Stillingfleet, 1681; Jeremy Taylor, 1676; Virgil, 1613; Plutarch's Morals, 1603; St. Augustus' City of God, 1610.

Another library, that of St. Andrew's church, singularly enough also numbering about 1,000 volumes as the two already referred to, came into existence Aug. 26th, 1833, and here we see the name of Andrew Heron in the issue of books. There is an index with reference to pages, 214 names, from 1833 to 1869, up to folio 274. Up to 1836 there are 120 names, showing that a large number of families attended St. Andrew's church. There was a catalogue costing 7½*d.* in 1835, and memorandum of copies sold up to 1843. The catalogue numbers 919 books. The only names on the list now attending the church are McFarland, Elliot, Davidson, Blake, Wynn, Carnochan. The first name is, as in Niagara Public Library, Andrew Heron. In 1836 occurs the name of one who afterwards became one of the Fathers of Confederation, Archibald McKellar. He attended the Niagara District Grammar School, was married by Rev. Dr. McGill: there are only two books marked against his name.

Many memories of the past are brought up by the names Barr, Lockhart, Crooks, Stocking, Whitelaw, Eagleson, Wagstaff, Miller, Malcolmson, McMicking. Many books were presented by friends in Scotland, but there are only a few old or rare books. The Harper's Library Series seem to have been well read. It may be recorded as worthy of notice that in the old record book of St. Andrew's church, dating from 1794, many of the names of the supporters are also found in the list of proprietors of the Niagara Library, 1800, showing the love of reading always remarked of the nationality most found in the Presbyterian church.

The successor to these libraries is the Niagara Mechanics' Institute, having been in existence since October 24th, 1848, as a copy of the constitution and by-laws, printed by F. M. Whitelaw, with names of members, one hundred and one, shows; Pres., W.H. Dickson M.P.P.; Vice-President, E. C. Campbell; Secretary, Dr. Melville; Treasurer and Libra-

rian, W. F. G. Downs. Among the committee are Thos. Eedson, John Simpson, Jas. Boulton, J. D. Latouche, B.A, Sam. Risley, Jno. Whitelaw. There is also a catalogue printed by Wm. Kerby in 1861, then numbering about 1,000 volumes. The library has gone through many vicissitudes; being closed for some time, it was greatly revived through the exertions of Dr. Withrow while a resident of Niagara, and has always owed much to the great interest shown in it by Wm. Kirby, F.R.C.S. It now numbers 4,000 volumes and has received much praise for its judicious selection of books.

When we think of the influence in any community of a good library, of the pleasure and profit derived, we think of the words of Ruskin. "We may have in our bookcases the company of the good, the noble, the wise. Here is an *entrée* to the best society. Do you ask to be the companions of nobles, make yourself noble; you must rise to the level of their thoughts, to enter this court with its society, wide as the world, multitudinous as its days; the chosen and the mighty of every place and time, here you may always enter. Into this select company no wealth will bribe, no name overawe; you must fit yourself by labour and merit to understand the thoughts of these great minds. You must love them and become like them." Judge, then, how much the people of this vicinity owe to the proprietors of the Niagara Public Library, furnishing to the young people of so many households reading of so high an order, fitting them to fight manfully the great battle of life.

CATALOGUE OF BOOKS.

Received into Library 2nd March, 1801—1 to 80.

1, 2, 3—Blair's Sermons.
4, 5—Walker's Sermons.
6, 7, 8—Divine Œconomy.
9, 10—Fordyce's Sermons.
11—Newton's Prophecy.
12—Smith's Prophecy.
13—Watt on Son of God.
14— " Improvement of Mind.
15— " Memoirs.
16— " Holy War.
17—Dyer's ———.
18—Willison on the Sabbath.
19—Boston's Character.
20— " Regeneration.
21—Anderson on Psalmody.
22—Cloud of Witnesses.
23—Scott's Essays.
24—Wilberforce's View.
25—Rise and Progress of Religion in the Soul.
26—Watson's Apology for Bible.
27— " " Christianity.
28—Religious Courtship.
29—Owen on Trinity.
30—Brown's Christian Journal.
31—Burton's Feeling.
32—Muirhead's Differentiation.
33—Brown's Oracles.
34—Robertson's History of South America, £1 12*s*.
35, 36—Robertson's History of South America.
37—Stanton's Embassy to China.
38, 39—Residence in France.

40, 41—Morse's Geography.
42—Bruce's Travels.
43, 44—Citizen of the World.
45, 46—Ossian's Poems.
47—Campbell's Narration.
48, 49—Croker on ———.
50—Caroline Lichfield. (Replaced in 3 vols.)
51—Blossoms of Morality.
52—Pleasures of Hope.
53, 54—Mirror.
55—Mental Improvement.
56—Lady's Library.
57—Cowper's Task.
58-60—Marvellous Magazine.
61—Bennet's Lectures.
62-65—History of Jacobinism, £2.
66, 67—Repository.
68, 69—The Rambler, £1 4s.
70—Letters on Courtship.
71—
73—Story Teller.
74-77—Emperor Charles V.
78—Burk's Revolution.
79—McIntosh's Revolution.
80—A letter to Burk.
81—Communicant's Companion.
82-89—Pope's Works, £2 10s.
90—Milton's Works.
91—Brydon's Tour.
92—Indian Concert.
93, 94—Burnet's Theory of Earth, £2.
95—Robertson's Proofs.
96—Young's Essays.
97-99—Robertson's History of Scotland.
100—History of War in Asia.
101-2—Burk's European Settlement in America.
103—Daniel and Revelation.
104—Gospel Its Own Witness.
105—Duty of Female Sex.
106-17—Rollins' History, £2, 8s.
118-19-20—Edinburgh Magazine, £3 18s.
39—Omitted in its place and carried to page 13, act. current, Boston's Memoirs.
121—Snodgrass' Revelation.
122-24—Gillies' Greece, £2 12s.
125-26—Moore's Letters.
127-28— " Journal.
129-30—Fuller.
131—Ray's Discourses.
132—Taplin's Farriery.
133—Female Complaints.
134-37—Wells' Geography.
138-39-40-41—History of British Admirals, £2.
142-43—Knox on Education.
144—Paradise Regained.
145—World Depths.
146-47—Boderick's Travels.
148—Constitution U. S.
149—Tracts presented by Andrew Heron.
150—History of Barbary.
To—more allowed for History of Charles.
151-52—Beattie's Essays.
153-54—Leland's Life of Philip.
155-56—Bloody Tribunal.
157—Bishop Burnet's History of His Own Times.
158-59—Quintius Curtius' History of Alexander.
160—Mendrill's Journey from Aleppo to Jerusalem.
161—Judah Restored.
162-63—Hervey's Meditation.
164—Goldsmith's Rome.
165—Adam's Views.
166—New Pilgrim.
167—Moral Repository.
168—Colet's Discourses.
169—Theological Magazine.
170-71—N. Y. Missionary.
172—Female Education.
173—Seneca's Morals.
174—Murray's Sequel.
175—English Reader.
176—Zimmerman on Solitude.
177—Fuller's Gospel of the Bible.
178—
179—Mackenzie's Voyage.
180-81—Morse's Gazetteer, £2.
182—Key to the Prophecies.
183—History of Iceland (presented by J. Young.)
184-85—Forbes' Works.

186-206—Hume's History of England, continued by Smollet (21 vols.) £7 4s.
207-212—Heine's History of Scotland, £3 17s.
213-17—Ferguson's History of Rome, £4 7s.
218—Kinneard's Edinburgh.
219—Heates' Pelew Islands.
220—Robertson's India.
221-22—Prideaux Connection.
223-28—Josephus' Works, £2 2s.
229-33—Edinburgh Magazine, £5 12s.
234-36—Edinburgh Review.
237-40—Johnson's Lives.
241-48—Shakespeare's Works, £2 12s.
249-52—Dryden's Virgil.
253-54—Silver Devil.
255-57—Gonsalvo of Cordova.
258—Joseph Andrews.
259-60—Humphrey Clinker.
261-62—Roderick Random.
263—John Bull.
264—Park's Travels.
265-70—British Tourists, £2 17s.
271-72—Heron's Journey.
273-76—Hawkesworth's Voyages.
277-80—Cook's Voyages.
281—Anson's Voyages.
282-83—Leland's Views.
284-86—Blair's Lectures.
287—Erskin's Discourses.
288—Campbell on Miracles.
289—Wall's World to Come.
290-91—Beattie's Evidences.
292—New York Magazine.
293—Fuller.
294—Thompson's Seasons.
294—Spenser's Shepherd.
296—Sherlock on Providence.
297—History of George III.
298-99—Knox's Essays.
300—Commerce of Ancients.
301—Thoughts on State of Religion.
302—Theological Magazine.
303—Memoir's of Gen.—
304—Fletcher's Appeal.
305—M. Magazine.
306—Forsyth on Trees.
307—N. Y. Missionary.
308—Saint's Everlasting Rest.
309—Gospel Sonnets.
310—Rushe's Charges.
311—Russian Empire.
312—Robinson's.
313-14—Talemachus' French and English
315—Aikins' Letters to his Son.
316-18—Adolphus' George III.
319-20—British Critic, £3 5s.
321-23—Edinburgh Review, £1 16s.
324-25—European Magazine, £2 8s.
326-27—Edinburgh " £2 6s.
328-29—Wilson's Egypt, £2 4s.
330-33—Pamela, £2.
334-36—Tom Jones, 18s.
337—Pictures of Palermo.
338—Vicar of Wakefield.
339-42—Burns' Works, £3 15s.
343—Percival's Ceylon, £3 12s.
344—Barrington's N. S. Wales.
345—Nisbet's Church History.
346—State of Europe. (Presented by Hon. R. Hamilton.)
347—Adams' Anecdotes.
348-61—Young's Agriculturist, £10.
362-66—Museum Rusticus, £3 4s.
367-68—Young's Tour in Ireland.
369-74—Wright's Husbandry, £3 12s.
375-76—Marshall's Midland County.
377-78—Adams' Agriculturist.
379-81—Doylin's "
382-83—Dickson's Husbandry.
384—Hart's "
385-86—Anderson's Agriculturist.
387—Gentleman Farmer.
388-92—Bath Papers.
393-94—Dickson's Agriculturist.
395—Dublin Society.
396—Small & Barrm.
397—Hume on Agriculture.
398-99—Horne on the Psalms.
400-7—Spectator, £3 4s. £5 5s. N. Y. currency is in Canada currency £3 5s. 7½d.
408—Mills on Cattle.
409-10—Pallas' Travels in Russia.
411—Whitman's Travels in Syria.
412-13—Adolphus' History of France.
414— " Reflections.
415-16—Winterbottom's Sierra Leone.

417—Card's Revolutions of Russia.
418—Pinkerton's Geography.
419—Gordon's Rebellion.
420—Population of Ireland.
421—Divernois on the Five Provinces.
422—Grant's Poems.
423-25—Palmerston's Letters.
426—Scot's Magazine, 1804.
427-28—European "
429-33—Edinburgh Review.
434—Sketches at Cape Good Hope.
435—War in St. Domingo.
436—Female Education.
437—Simpson's Plea for Religion.
438—Brown's Sermons.
439—Religion of Greeks.
440—History of Popes.
441—Abelard and Heloise (presented by Mr. Alex. Cameron, Student-at-Law.)
442—Farmer's Boy.
443-44—Marshall's Yorkshire.
445—Tull's Husbandry.
446—Court of St. Cloud.
447—Scot's Edinburgh Magazine.
448-53—Edinburgh Review.
454-57—British Critic, £4 10*s*.
458-65—Bruce's Travels, £7 4*s*.
466-69—Blackstone's Commentaries.
470—Grant's Voyages to N. S. Wales.
471-72—Cyrus' Travels.
473—McHinnem's Tour.
474-79—Plutarch's Lives, £1 13*s*.
480—Peyrmsis' Voyages.
481-89—Witherspoon's Works, £2 8*s*.
490—Sir H. Moncrieff's Sermons.
491—Chatham's Letters.
492—Mallory's Memoirs.
493—Masson's Cookery.
494—Lavater's Physiognomy.
495-98—Don Quixote, £1 18*s*.
499-502—Arabian Nights.
503-05—Edgeworth's Tales.
506-10—Tales of the Castle.
511—4 Peregrine Pickle.
515—Estelie.
516—Devil upon Two Sticks.
517-18—Excessive Sensibility.
519—Man of Feeling.
520-22—Ramsay's Works.
524—Tuckey's Voyages N. S. Wales.
525—Edwards on Baptism.
452-53—European Magazine, omitted.
526-28—Plains.
529-31—History of France.
532—Musical Repository.
533—Speechly on the Vine.
534—Selkirk on Emigration.
535—Fisher's Travels in Spain.
536—Bigland's Modern Europe.
537—Michavois Travels.
538—Scot's Magazine.
539-40—European Magazine.
541—Lady's Magazine.
542-45—Edinburgh Review.
546—Jackson on the Mediterranean.
547—Hinchley's Fall of Venice.
548-49—Repton's Odd Whims.
550-51—Father's Gift.
552-55—Children of the Abbey.
556—Lucas on Duelling.
557—Bravo of Venice.
558-60—Count de Valmont.
560-63—Men and Women.
564— of Seduction.
565-66—Tour of
567—Sermons.
568-79—Henry's History of Great Britain, £6 15*s*.
580-83—Edinburgh Review.
584-85—Scotch Magazine.
586-88—Annals of Great Britain.
589-90—Dick's Selections.
591—Cook on the Resurrection.
592-93—Robertson on Atmosphere.
594-97—Trevanion.
598—History of Masonry.
599-601—Kaines' Sketches.
602-3—Malthus on Population.
604-11—Goldsmith's Animated Nature, £2.
612-14—State of the Times.
615—Scotch Magazine.
616-17—European Magazine.
618—Lady's Magazine.
619-20—British Critic, £2 8*s*.
621-23—Edinburgh Review.
624-26—Smith's Wealth of Nations.

627-29—Ferguson's Lectures.
630-33—Sinclair on Longevity.
634-36—Pickard's West Indies.
637—Public Characters, 1809-10.
638-40—Lounger.
641—Lives of British Naval Heroes.
642—Stewart's Philosophy of Mind.
643-46—Gil Blas.
647-49—Owen on the Spirit.
650-51—Gilpin's Lives of Reformers.
652-59—British Plutarch.
660—Mason on Self-Knowledge.
661—New Picture of Edinburgh.
662—Sterne's Sentimental Journey.
663—Spirit of the English Wits.
664—Saville's Dissertation.
665—Pilgrim's Progress.
666—The Mountain Bard.
667-70—Medical Journal, £3 11*s.*
671-75—Fool of Quality.
676—Chesterfield's.
677—Scotch Magazine, 1809.
678-79—European Magazine.
680—Lady's Magazine.
681-82—British Critic.
683-86—Edinburgh Review.
687 to 711—British Theatre, 25 vols., £11.
712-15—Cutorell's Gazetteer, £5.
716—General Atlas, £2 5*s.*
717-18—Craig's Sermons.
719—Moore's Tales.
720-21—Thornton's Turkey.
722-29—Enfield's Encyclopædia.
730-31—Count Fathom.
732—Vince on Atheism.
733-34—More's Utopia.
735—Cottagers of Glenburnie.
736—Adventures of D———.
737-40— " a Guinea.
741-43—Belinda, £1 2*s.* 6*d.*
744-45—Caroline of ———.
746—
747—Letters from a Loyalist.
748—Hill's Life of Dr. Blair.
749—Life of Buchanan.
750-51—Clarkson on the Slave Trade.
752—Resources of Britain.
753—Scotch Magazine.
754-55—European "
756—Lady's "
757-58—British Critic, £2 8*s.*
759-62—Edinburgh Review.
763-64—Porteous' Sermons.
765—Moorehead's Discourses.
766—Gray's Letters.
767-68—History of Chili.
769—Trotter on Drunkenness.
770-72—Letters from the Mountains.
773— " of Swedish Court.
774—Twin Sisters.
775-82—Clarissa Harlowe, £2 14*s.*
783—Man of the World.
784—Paul and Virginia.
785-86—History of St. Helena.
787-89—Edgeworth's Tales of Fashionable Life, £1 8*s.* 6*d.*
790—History of Charles XII.
791—Scotch Magazine.
792-93—European "
794—Lady's "
795-96—British Critic.
797-800—Edinburgh Review.
801-2—New Annual Register.
803-8—Gifford's Life of Pitt, £6 6*s.*
809-13—Camilla, £1 14*s.*
814—Description of 300 Animals.
815-17—West's Letters to Young Men.
818—Park's Rudiments of Chemistry.
819-20—Tolney's Travels.
821-22—Walker's Sermons.
823—Lady of the Lake.
824—Island of Jamaica.
825-27—Tristram Shandy.
828-35—Edgeworth's Moral Tales.
836-37—British Critic, £2.
838-39—British Critic, 1813, £2.
840-41—Edinburgh Annual Register.
842-43— " " " £2.
844—Scotch Magazine, 1812.
845-47— " " 1813, 1814.
848-49—European Magazine.
850—Lady's "
851-53—Edinburgh Review.
854—British Critic.
855-56—Annual Register, 1811.
857-61—Edinburgh Register.
862-63—Goldsmith's ———.
864-67—Modern Geography.
868—Savage New Zealand.
869-70— Magazine.

871—Castle of Otranto.
872—History of Otaheite.
873-74— " the War.
875-77—Edinburgh Review.
878-79—Gordon's Ireland.
880-81—Edinbugh Register.
882-85—Young Philosopher.
886-87—Peregrine Proteus.
888-90—The Jesuit.
891-95—Scottish Chiefs, £3 4s.
906-8—Waverly.
909—E. Annual Register.
910—Scotch Magazine, 1814.
911-12— " " 1815.
913—Clark's Life of Nelson.
914—Colonial Policy.
915-16—Life of Wellington, £2.
917—European Magazine.
918-20—Scot's Magazine, 1816.
921—Lady's Magazine.
922-27—Edinburgh Review.
928—Annual Register.
929— " " , 1815.
930-31—European Magazine.
932-33—Edinburgh "
934—Lady's Magazine.
935-37—Edinburgh Review.

NOTES ON THE HISTORY OF THE AMALGAMATION PROCESS.

By Robert Dewar.

(Read 27th April, 1893.)

The amalgamation process, although generally believed to be modern, is by no means so, but has really gradually developed through centuries of use to its present position in metallurgical science. We have reasons to believe that the ancient Egyptians were acquainted with this process. Indeed the attraction of mercury for other metals, especially gold and silver, but apparently more especially gold, appears to have been known from the most remote antiquity, and from time immemorial mercury has been used in "streaming for gold," as the process was called. Vitruvius remarks that gold might be recovered from embroidery and old clothes by the use of mercury, and Pliny mentions a process for the gilding of brass and other metals by gold amalgam, remarking that mercury dissolves gold, thus separating it from impurities, and on straining it through leather pure gold is left; to be sure it is really the gold amalgam that is left in the leather. The process called streaming was used to collect the fine gold disseminated through the sand composing the beds of streams or rivers, and consisted in first washing the sand, then triturating the residue with mercury and straining off the superfluous mercury through leather. By miners it was used in a similar manner. The gold ore was first ground and then triturated with mercury in mills; but these mills proved in the long run unsatisfactory as the residuum was found to retain a large quantity of the gold and it was necessary to subject it to a roasting, so that at the commencement of last century they were almost universally abandoned. An opinion prevailed among chemists about this time that unless both the silver and gold existed in the pure state in the substance under treatment by the amalgamation process, then the mercury would fail to dissolve them, and hence the belief, which there was sufficient reason for, that while fire treatment caused the ore to yield the whole of its gold, the amalgamation process did not. This opinion was supported by the most celebrated metallurgists of that period, such as Schlüter, Gellert, Wallerius and Cramer, the result being that the amalgamation process was relegated to that class of processes described as not applicable on the large scale. It may be added that the streaming process was, as used by different nations, exactly the same in procedure as the above.

According to the late Dr. Percy, the first mention of mercury in the metallurgy of silver is made in a treatise by one Biringuccio, an Italian, and published in 1540. The process is performed in a stone or timber basin in which a millstone revolves; the matter to be treated is ground in a mortar, washed and dried, then put into the hollow of above-mentioned basin and ground with the millstone, while being moistened with vinegar or water in which is dissolved corrosive sublimate, verdigris and common salt, the whole being covered with mercury. The millstone is then caused to revolve, stirring the material for two or three hours by hand or horse-power, according to plan adopted. When amalgamation is supposed to be completed the amalgam is separated by a sieve or washing, or passing it through a bag and then retorting or distilling, the gold, silver or copper is obtained. Dr. Percy also states that he (Biringuccio), in a prior description, mentions the use of vitriol and the bag as being made of deerskin leather. This is undoubtedly the result of a long development of the primal process in which merely the mercury was employed, and the earliest treatise extant on the amalgamation process in which "chemicals" (to use an expression common in some branches of the amalgamation process) are mentioned as being used in combination with mercury, thus marking the transition from a mere empirical operation to a scientific process, the result of experimental science. This process was restricted not solely to ores, but applicable to recovering gold or silver from the sweepings of mints, goldbeaters and goldsmiths. Schlüter mentions in his work, published in 1738, that the amalgamation process was used in treating the silver ores of Kongsberg, in Norway, as also the "sweep" of mints and goldsmiths' workshops was treated for recovery of metal by the amalgamation process in Germany when too far removed from smelting works or owing to poverty of stuff. Schlüter, seemingly, does not state how long prior to the appearance of his work the process had been in operation in Norway or Germany; but it is known—at least I find from a metallurgical work in my possession, printed last century—that the process was very unpopular in Europe, and, as I before stated, when Schlüter himself, and Wallerius, Cramer and Gellert thought it not practical on a large scale, it is not strange that Baron Inigo Born met with friction in his successful efforts last century to introduce the amalgamation process into European countries.

The Norwegian process, according to Schlüter, was conducted in mills consisting of a shallow cylinder surmounted by a tub, of which the cylinder is the bottom; the tub is constructed of wood, its inside walls being flush with inner surface of cylinder forming bottom, in the centre of the bottom of pan is a pivot, over which fits a cast iron cross, with arms almost touching side of pan, and being at right angles to one

another; into opposite ends of the cross fit fork-like prongs which are attached to a spindle, at the top of which is a pinion to which a rotatory motion is given by a horizontal crown wheel, as many as eighteen being driven in this manner—the power employed being water—by one crown wheel, although there were also small ones in use which a man could work. The front portion of the tub was pierced by two or three holes, in the same line on different levels, through which the sludge at different periods might be withdrawn from within. The substance was ground, if coarser than sand, and concentrated as much as possible; about two tröge (according to Dr. Percy=to from 40 to 50 lbs.) are thrown into the mill and water added, then 40 lbs. of mercury. Grinding now is started, but should the mill be able to take more it is added with sufficient water to prevent stiffness. Grinding is continued until the whole is brought to a state of mud, when the top plug in the top hole above-mentioned is now removed and the mud allowed to run off to this level, when another charge is added; this is continued until the mercury has absorbed sufficient gold or silver to make it stiff, thus impeding the rotatory motion of the cross, when the tub is emptied of slime and the amalgam taken out, cleaned and dried, and squeezed through a calf-skin bag and distilled; the distilled mercury always retaining a certain quantity of gold or silver, the retort broken and the silver taken out and melted. The amalgamation process as applied to silver had its primal demonstration on a large scale in Mexico, Chili, and Peru. Dr. Percy, in his Metallurgy of Gold and Silver, says that Bartolome Medina was generally admitted to be the inventor of the present "Patio process," having invented it in 1557 while a miner at Pachuca in Mexico; the authority for this statement being two documents, one, a report addressed to the Viceroy of Mexico, by Luis Berria de Montalvo, printed in the city of Mexico in 1643, and the other a memoir by Diaz de La Calle to Philip IV., printed in Madrid, 1646, both giving Medina the honour and credit of the invention. Dr. Percy then adds that this statement is not correct, as Don José Garces y Eguia, says that the first treatise on amalgamation as then conducted was that of Barba, published in Peru, 1639, the process being introduced into Peru by Don Pedro Fernandez de Velasco in 1571. Dr. Percy does not mention when the process was introduced into Mexico, but I have found by consulting the work before mentioned as in my possession, that the process was introduced into Mexico by the same person (Don Pedro de Velasco) five years before his introduction of it into Peru, namely, in 1566. Now, whether the Patio process was ever introduced into Mexico is a point that might be raised. The enormous amount of gold and silver that had been collected and stored by the Caciques that ruled the Aztecs, which was

found on the investiture of Mexico and Peru by the Spaniards, is a thing that is universally known and believed. Now as the Aztecs, or rather the Toltecs, whom the Aztecs subjected, were well advanced in the fine arts, is it too much to imagine that they were considerably advanced in metallurgical science, so far advanced as to enable them to have such a process? or how account for the enormous amount of metal that was in the country, as the present appearance and present existence of free metal in Mexico are not favorable to the theory that these metals were extracted by the Toltecs, and after them the Aztecs, from ore containing the metals in the free state? The objection may be made that for these ancient peoples to have had this process they must have mercury; to this the answer may be made that there are more deposits of mercurial ore in that country than is supposed, and these people would undoubtedly know how to reduce it, as at some of the localities it is found in the native or metallic state reduced by internal heat; but at the best this is merely a suggestion, and the existence of Vannocio Biringuccio's treatise which is identical in its principles with the Patio and published 26 years before the said introduction into America of the process is rather against it, and rather leads to the conclusion that it was long before known in Europe. It is unnecessary for me to describe *in extenso* the Patio process or Gallero process, as it is called in some parts of Mexico, as it has been exhaustively treated of by many metallurgists, among others Alonzo Barba, in his work published in 1639, and during this century by such as Philips and Dr. Percy; indeed, the section of Dr. Percy's work devoted to this process is the most complete extant. I might be allowed to add that there is an indiscriminate use made of the words *Arrastra* and *Tahona* by most authors in describing this process; arrastra is the name used when the motive power is given by mules harnessed to the arm, and tahona is used when the motive power is water—although when in Mexico three years ago I asked the name that was given to the arrastra which was in the Government mint at Guadalajara, and which was driven by steam, and was answered that it was an arrastra.

I might also say I noticed while in Mexico a thing which is not mentioned, at least I have failed to find it in any of the works at my command, and that was the use of men instead of horses in the Patio process. These men that tread the ore are called "Repasedors," and received four reales (4), about fifty cents Canadian or two shillings one penny (2s 1d) British, for every six (6) cargas (equal to (1800) eighteen hundred pounds avoirdupois) of ore which they amalgamated. Their motions are peculiar and indescribable, and require to be seen to be understood; the body is held erect, the right hand grasping a staff, or if a staff is not used to steady, the arms are swung in unison

with the movements of the legs, the legs are raised without bending the knee at an angle from the body, the toes turned out in descending, the heel striking the lamo first, and as the heel touches it the other leg is raised, in this way he proceeds all over his little lamero until it is finished. But notwithstanding all that has been said, there is a loss of the metal contained in the ore as well as the mercury, which is an expensive item; there is no doubt that during last century, especially towards the end, it (the Patio Process) was at its zenith in Mexico as a metallurgical process, which is borne testimony to by a report about that time by one Jose Acosta, who said that in Potosi alone seven thousand (7,000) quintals of mercury were used annually in dressing the ore, not to mention the mercury recovered from the first washing; but it has gradually lost ground since until it has been replaced at innumerable mines by other processes. In Mexico the cauldron or cazo process is one that has been used with much success. Without giving a description of it, it might be said that the apparatus instead of being as now a vessel formed either of blocks of stone or wooden staves like those of a tub, the bottom being a slab of copper 2½ inches in thickness, the metallic bottom retained the same as the head or bottom of a barrel being retained by a groove running round the interior of the vessel, the original cauldron, as invented by Alonzo Barba, was essentially "to be of copper pure, as any alloy present in the copper would involve the mercury taking it into solution; they must be in shape inverted cones and flat bottomed, the under part to have a rim of 6 or 8 inches high and half an inch broad, all beat of one piece; other plates of copper are fixed in the inside by copper nails, it must be water tight, the inside of the boiler to be lined with lime and ox-blood, the upper part surrounded by iron rings, to which is fixed a crossboard carrying at its centre a spindle with wings, which revolves, agitating the contents of the cauldron."

The cazo process or hot amalgamation was accidentally discovered by Alonzo Barba. When trying to fix mercury by boiling silver ore, mercury, and water, mixed in a copper dish, he found that he had a shorter method of amalgamation; he gradually improved on this and introduced it into practice in Peru, in which it was successful in its application to the treatment of chlorides, bromides and iodides of silver which are abundant in that country, and also the ores containing silver in the free state. It was introduced in the sixteenth century and has been in use ever since. There is no change in the process since it was invented, with the exception of the above mentioned replacement of the cauldron entirely made of copper for the one with merely a copper bottom; indeed it was averred by Barba that nothing but a cazo of solid copper would do, but the great corrosion of the copper and the consequent expense

led to the adoption of the present form; with the exception of the above mentioned change the process is identical as first practised.

In 1588 Don Juan De Corduba, a Spaniard, applied to the court of Vienna proposing "to extract silver from its ore whether poor or rich by mercury, and in a short space of time." He made several experiments on a small scale on several kinds of ore which succeeded very well, but on attempting with (20) twenty quintals he failed, and one Lazarus Erker, who was employed to give in a report on the process, disapproved of the method and here it dropped. Baron Inigo Born imputed the failure to his ore not being calcined, his not using salt and the weather being cold. A writer of that period adds to an account of this failure that "Corduba could have remedied the last cause of failure, namely, the cold weather," and I believe he could. The Tintin process as practised in Chili was really a modification of the "streaming for gold" process, and though not generally known was invented by a Franciscan Friar; it was applicable only to ores containing free metal, the apparatus being a stone mortar nine (9") inches deep and 9" wide; the ore being ground along with mercury in it by an iron pestle; the metal contained in the overflow being caught and settled in tanks, afterwards to be treated by the Patio process. This was in use from the sixteenth century in Chili and Peru. The Trapiche and Maray were likewise a modification of the "streaming for gold" process, and some give Barba the credit of having invented them, although I believe he does not claim the honour. The Trapiche is the modern Chilian mill; both have been in use since the sixteenth century.

"The Tina System," or "Sistema de Cooper," as practised in Chili is really a modification of the old abandoned Norwegian process, which I before mentioned, and from about 1825 has been used very extensively and successfully, although only applicable to ores containing free metal. The machinery is greatly improved over the old Norwegian.

Stove amalgamation as practised in Mexico is merely a modification of the Patio, in which the regular process is interrupted in the middle, the ore being conveyed to an estufa or stove, where it is gently heated for two or three days when the Patio process is resumed.

During last century Baron Inigo Du Born succeeded, notwithstanding obstacles thrown in his way, in introducing his amalgamating process at Chemnitz, in Lower Hungary. The process consisted in first stamping the ore dry to a coarse sand (Du Born remarking that "wet stamping would bring on great loss of silver and expensive contrivances to prevent or recover it"). The battery consisted of three stamps to each mortar, the sole or bottom alone being cast iron, each stamp-head weighing

40 to 54 pounds. The stamping is proceeded with, the ore being damped from time to time to prevent loss by ejection; the ore is then passed through brass sieves, and that portion coarser than sand is returned to the stamps. It is then conveyed to a mill, the running stone of which is kept in a box and nothing but the admission funnel being left open. The mill stones were made of porphyry. The ore being ground fine enough was taken to the furnace to be roasted. The furnaces apparently were modified, double-hearthed reverbatories as far as I can gather from the description. When the furnace was at the proper temperature, about 30 quintals was spread evenly over the hearth and the required amount of salt and lime — the amount required being previously determined by assay — was spread over, then the whole turned with crooks and rakes until thoroughly mixed; the process then proceeded as calcination in double-hearth roasting furnaces of to-day. If during the calcination the material clagged, grinding and sifting were again resorted to. The ore was then, if properly calcined, conveyed to the boilers or amalgamators constructed according to the "recommendation" of Alonzo Barba, the stirring apparatus being put in motion by the crank of a water wheel and a horizontal rack with cogs, which being properly fixed in a groove by cross-bars, slid backwards and forwards on brass rollers and casters, the cogs of the rack catching in the perpendicular trundle and spindle of the stirrers which turned round twice by a three and a half ($3\frac{1}{2}$ ft.) foot motion of the sliding rack. The stirrers were circular segments corresponding with the sides and bottom of the boiler. The ore was mixed with sufficient water to make it fluid and the amount of mercury required being gauged from appearance; if the ore was light and voluminous more mercury was required than if it was heavy and compact, the presence of antimony or lead in the ore necessitating an excess of mercury to provide for the neutralizing effect of these metals on the mercury. The residuum or tailings were then washed in tubs provided with stirrers. The amalgam was then freed from excess of mercury by compressing small portions in the hand at a time, as the deerskin was considered too expensive a process. The distillation was then performed "per descensum" in iron pots; the under one standing up to the middle in cold running water, which passed under the hearth, the upper part appearing about two (2") inches above it. The amalgam made into balls and placed in an iron cullender fixed to an iron tripod was set in the bottom pot, covered on the inside with a coarse cloth. The upper pot was then inverted on the lower one and luted; fire then being put about it the mercury was sublimed and condensed in the bottom pot kept cool by the water; a strong red heat being kept up

for five or six (5 or 6) hours, the cloth is converted into a tinder and afterwards scraped off the cullender by a brass brush.

In 1790 the "Freiberg," or "Barrel process," of amalgamation was introduced at Halsbrücke, near Freiberg, in Germany. The ore contained, beside the silver, antimony, arsenic, copper, lead, iron, and zinc, and sometimes gold, bismuth, nickel and cobalt; in small quantities the silver varied all the way from 15 to 200 ounces per ton, these were mixed to make an average of 75 to 80 ounces per ton; latterly the rich and poor were kept separate, as it was found to be more economical to do so. It was required at least that 25 per cent. of iron pyrites be contained in the ore. If the amount contained in the ore was less than this, addition was made either of pyrites or sulphate of iron, when the pyrites or other sulphides were in excess, the roasting was resorted to to get rid of it, as in the other processes. The ore was roasted in a state of fine division with salt, the oxidation of the pyrites causing the evolution of chlorine and hydrochloric gases, which coming in contact with silver sulphides and other salts of that metal, converts them into chloride; the ore was ultimately amalgamated in revolving barrels; a minute description of this process may be found in any of the standard works on metallurgy. This process was abandoned at Halsbrücke, in 1856, on account of its expensiveness and its unsatisfactory results when applied to certain classes of ore. Over half a century had changed the relationship existing between the prices of labour and fuel; so that it was found to be advantageous to give up the amalgamation process and smelt the ores with others containing lead. This process has also been in use to a certain extent in the United States and also in Mexico. The amalgamation process employed at the Mansfield Copper Works to obtain the silver contained in copper matter was similar to this, but has since been abandoned for Ziervogel's process.

In 1859 the Washoe or Pan process was invented to treat successfully the ores of the great Comstock lode, situated at Virginia City in the Washoe District, State of Nevada. It received the name "Washoe" from its first being introduced in this district. It really owed its invention to the failure of both the Barrel and Patio processes, as both from metallurgical and climatological conditions these processes were unsuited for and proved a failure in the attempts made to apply them to the ore, which contained from $30 to $150 per ton of 2,000 lbs., besides zinc blende, galena, argentite, iron and copper pyrites, and sometimes stephanite and polybasite. The gold occurring to the amount of one-third of the total value of the ore, one portion of the ore only could be treated by the Barrel amalgamation process, and this was that portion

which assayed above $150 per ton; all the rest of the ore below this being treated by the Washoe process. In this process the ore is ground wet in stamp mills; after having been reduced to a suitable size for feeding, the ore passes off in suspension in water through sheet-iron screens and is collected in reservoirs from which it is removed to the pans to be ground with mercury and hot water, with or without the addition of cupric sulphate and common salt—the amount of this used varying in different works but generally consisting of from one to three pounds—to each charge of ore which consists in the old pans—those of Varney, Wheeler, Hepburn and Peterson—of 1,200 to 15,000 lbs. of ore, but in the later and larger pans—those, for instance of McCone and Mountain —the charge is 4,000 to 5,000 lbs. The description of this process and the machinery employed in it have been so voluminously treated of that it would be superfluous for me to again describe it. Suffice it to say that the benefit of the "chemicals" is doubted by some and the real action of them is not understood. As far as the conducting of the live steam into the pulp is concerned, either loose or in the shallow chamber, it appears to me that its principal effect and value is that it keeps to a certain extent the mercury from flouring. The Boss continuous process, patented by Mr. Boss of United States, is a modification of this process, in which a series of pans are employed, into which the pulp passes, instead of it passing directly into the separators.

Although amalgamation of gold ores was effected in the streaming mills, arrastras and Chilian mills for centuries, it was not until this century that amalgamation was effected in the batteries of stamp mills, and at the present time the greatest portion of the gold ores are treated in this way, amalgamation being effected by the mercury added and the amalgamated copper plates fixed to the inside of the mortar boxes or caught on the amalgamated apron riffles of the sluices. A great many contrivances have been invented for the tailings besides the amalgamated rifles; blankets, sluices were used, and also various jiggers, buddles, vanners, etc., for concentrating these tailings, which are afterwards treated in such machines as the Attwood amalgamator, the Eureka rubber pans, the Hungarian mill (which was used at Chemnitz and other localities), and various other inventions. Stamps themselves date far back as grinding mills, though not so as amalgamators. Various mills of late years have been invented as direct amalgamators, notable among which is the Crawford mill. This mill consists of a pan or basin of cast iron supported on four iron uprights, which are attached at the bottom to a circular iron frame which forms the base. The bottom of the pan or basin is elevated at its centre and gradually slopes to the sides; a little over half-way to the sides the bottom suddenly is depressed,

thus forming an annular groove round the outer edge of the bottom of the basin. Through the centre of the bottom of the pan or basin; where there is an opening, a short upright piece of shafting passes, which fits at the bottom into a journal in the centre of the base. After passing through the opening in the bottom of pan, it is attached at its top extremity to a false bottom, which fits upon the true bottom, almost completely covering the above-mentioned groove, leaving only a small space open communicating with the upper part. The sides of this false bottom, as also the sides of the pan at the same level, have steel castings attached to them. On the area formed by the steel castings, which form also a groove which forms a half circle and a complete ring round the pan, balls of iron are placed which revolve when the false bottom, which is attached to the upright shaft, is set in motion by gearing attached to the shaft between the bottom of pan and base of stand; over the pan is bolted a dome, which at its apex continues perpendicular to form a pipe, round which near its top is a circular stage with a spout; inside this "pipe" fits a second, whose mouth is expanded to a filler; the bottom extends down further than the commencement of the apex of the dome to almost the level of the tops of the balls; this acts as the hopper through which the ore is fed. To the bottom, at one side of the first-mentioned annular groove, is attached a mercury pipe, through which the mercury is fed to the mill; a water pipe enters at that part of the centre of the bottom where the upright shaft, bearing the gearing for driving, enters; an oil supply pipe also supplies oil to the bearing of the shaft as it enters the bottom of pan.

The ore is fed by the hopper and is ground by the circular motion of bottom and balls to one hundred to two hundred (100 to 200) mesh. The first-mentioned annular groove, is filled with mercury, into which the finely divided gold gravitates through the water; the matrix and other minerals being finely divided and having a less specific gravity than gold are forced up and carried off by the water, the water passing off by the opening formed by the pipe of the hopper and the continuation pipe of the dome, it rises through this space, falls over on the circular stage and flows away by the spout; the water enters with a considerable upward pressure, which keeps everything but the gold from reaching the mercury, this pressure is exhausted by the lateral sweep of the balls and expansion in the wide dome. The mill is claimed to be able to treat any and every ore of gold, arsenical, pyritical, antimonial or the most refractory ore and save over (90%) ninety per cent., requiring less power than "stamps," and one-fourth (¼) less water, and one very good thing about it, I think, is that the tube by which the amalgam is drawn off is securely

padlocked, thus preventing the stealing of amalgam, which, as we are all too well aware, has been practised too often in the past.

Thus the amalgamation process stands to-day the result of development from the old "streaming for gold" mill to the stamp mills, and mills of Crawford type; from the process of Vanoccio Biringuccio to the Patio, Barrel or Freiberg, and Pan or Washoe process. The use of chemicals seems to have received a fair share of consideration, although we are a little startled by the statement made in an anonymous Latin account of amalgamation similar to the Patio in which ground horns, bricks, and sulphur are added to the usual complement of chemicals, and said to have been practised in Guatemala by the writer; the sulphur astonishes us when we know the dire results of its coming in contact with either the gold or mercury in the amalgamation process. The applications in November, 1864, by Dr. Wurtz, of New York, and in February, 1865, by Mr. Crookes, F.R.S., of London, for the patent for the use of sodium amalgam in the amalgamation process, Wurtz for America, and Crookes for Britain, revealed the fact that both had been experimenting on the same principle for the benefit of science without the knowledge of the other. This is at least one point of general interest in the amalgamation process; but although extensively tried both in California and Australia, the results obtained differed greatly, and it was not used as much as had been expected, although up to the present it has its partisans, and to a certain extent, it had a beneficial influence. I have noticed that mill men prefer mercury that has been formerly used which is known to contain gold or silver amalgam, as it is supposed to be more effective in absorbing the metals than the clean mercury. The amalgamation process, according to some, has reached its zenith; whether this is so or not is hard to say, whether more brilliant inventions and discoveries will be made in the application of the amalgamation process remains to be seen. Time alone will tell. One thing is apparent to all, namely, that other chemical processes are gradually gaining ground and recognition, although our dear old friend is holding the ground bravely, and it may be said in conclusion that it can look back at its past and honorable history, as a nobleman looks back over his long line of descent, and may treat with scorn the upstart claimants of a day for the honorable position of the Amalgamation Process in Metallurgy.

NOTE.—A number of attempts have been made to apply electricity in the amalgamation process by means of sending electric currents through amalgamated rifles, terraces and aprons; noticeable among others was the machine invented by one Charles M. Dobson in 1887, in Toronto,

considerable notice of which was taken and a full description given by the journals of that date. The electricity was applied in this machine by means of a carbon shod diaphragm, which moved backwards or forwards over the surface of amalgamated copper plates, the electricity being supplied by a small dynamo. The advantages claimed for this invention were that the electricity as conducted by the carbon shoes kept the surface of the mercury clean and bright, volatilizing any sulphur or arsenic which came in contact with it and agitating any other metallic constituent present, thus keeping them from coming in contact with the mercury and allowing the gold and silver the full benefit of the pure mercury. No further comment is required on this subject, further than that these inventions enjoyed existence for a very short time.

6.1
-69
!2t

UNIV.
OCT

Transactions

— OF —

The Canadian Institute.

No. 8.] DECEMBER, 1895. [Vol. IV., Part 2.

Toronto:
The Copp, Clark Company, Limited.
1895.

PRICE - $1.00

CONTENTS.

PAGE.

ABSTRACT OF MINUTES 223

FORTY-FOURTH ANNUAL MEETING 244

FORTY-FOURTH ANNUAL REPORT 245

THE BLACKFOOT INDIANS.
Rev. John MacLean, M.A., Ph.D 249

BUDDHIST INSCRIPTIONS OF INDIA.
Rev. John Campbell, LL.D 261

JOURNAL OF CAPT. WALTER BUTLER.
Capt. Ernest Cruikshank 279

MEMOIR OF CAPT. WALTER BUTLER.
Capt. Ernest Cruikshank 284

EARLY TRADERS AND TRADE ROUTES.
Capt. Ernest Cruikshank 299

MEMORABLE EPOCH IN CANADIAN HISTORY.
Sandford Fleming, LL.D., C.M.G. 314

THE OSSIANIC CONTROVERSY.
Rev. Neil MacNish, B.D., LL.D. 319

NIAGARA LIBRARY.
Janet Carnochan 336

AMALGAMATION PROCESS.
Robert Dewar 357

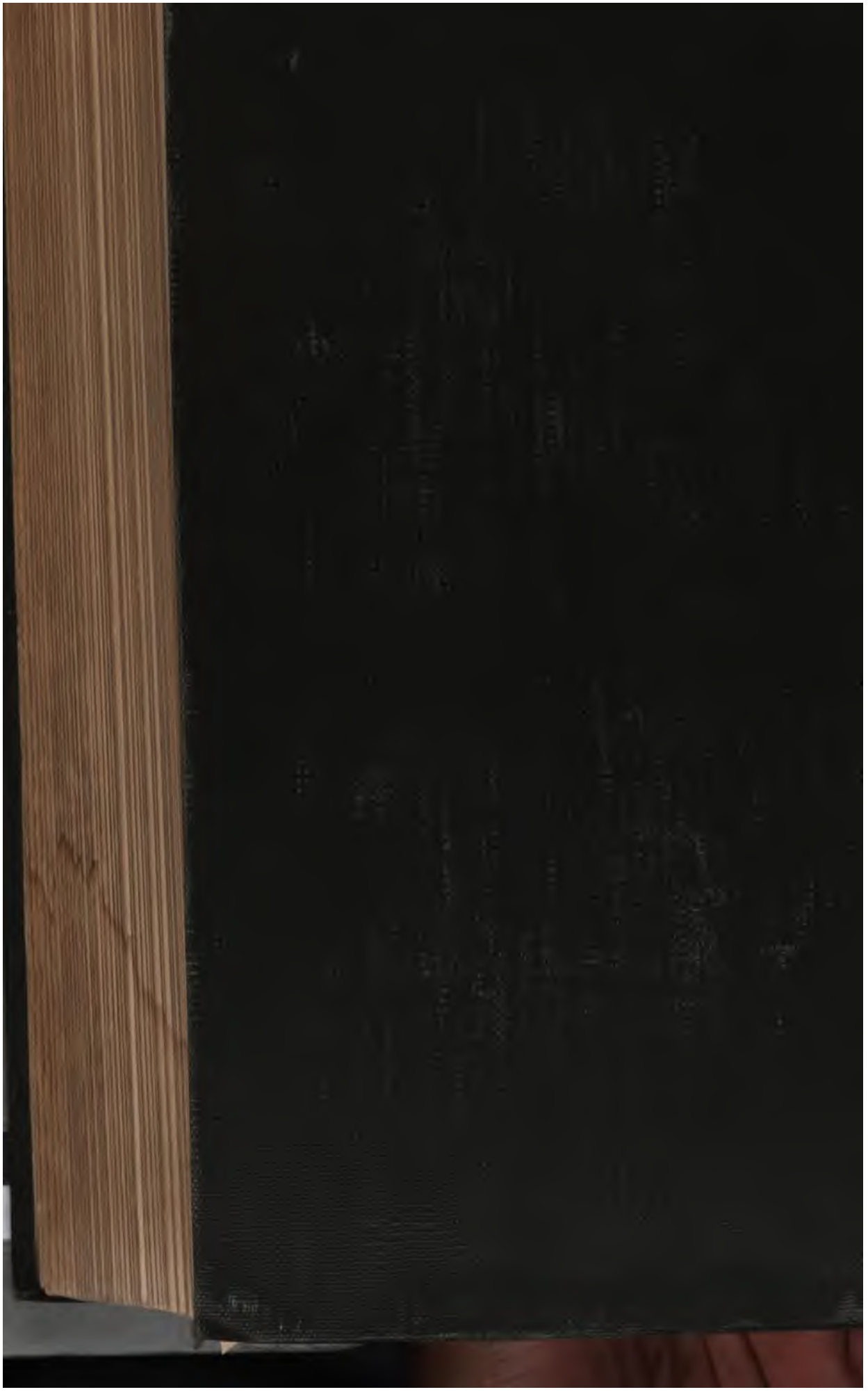
THE UNIVERSITY OF MICHIGAN

DATE DUE

APR 29 1988

JAN 15 1988

1909

UNIVERSITY OF MICHIGAN
3 9015 01225 2717

DO NOT REMOVE
OR
MUTILATE CARD